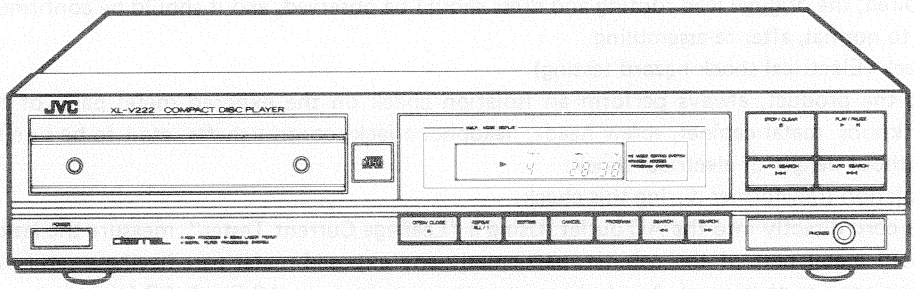
JVC

SERVICE MANUAL

COMPACT DISC PLAYER

MODEL No. XL-V222BK



COMPACT disc DIGITAL AUDIO

COMPU LINK Component

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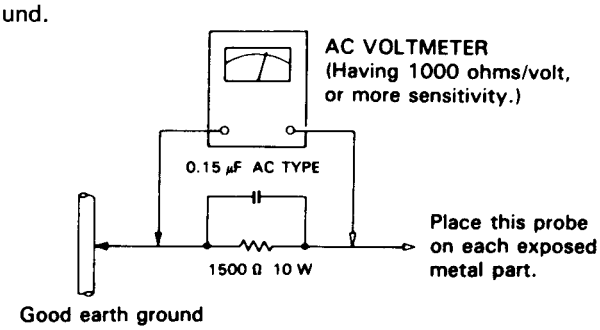
No. 20029
Feb. 1988

Safety Precautions

1. The design of this product contains special hardware and may circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Service should be performed by qualified personnel only.
2. Alterations of the design or circuitry of the product should not be made. Any design alterations of the product should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting therefrom.
3. Many electrical and mechanical parts in the product have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the Parts List of Service Manual. Electrical components having such features are identified by shading on the schematics and by (⚠) on the Parts List in the Service Manual. The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement part shown in the Parts List of Service Manual may create shock, fire, or other hazards.
4. The leads in the products are routed and dressed with ties, clamps, tubings, barriers and the like to be separated from live parts, high temperature parts, moving parts and/or sharp edges for the prevention of electric shock and fire hazard. When service is required, the original lead routing and dress should be observed, and it should be confirmed that they have been returned to normal, after re-assembling.
5. Leakage current check (Electrical shock hazard testing)
   After re-assembling the product, always perform an isolation check on the exposed metal parts of the product (antenna terminals, knobs, metal cabinet, screw heads, headphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.
   Do not use a line isolation transformer during this check.
   - Plug the AC line cord directly into the AC outlet. Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground. Any leakage current must not exceed 0.5 mA AC (r.m.s.).
   - Alternate check method
     Plug the AC line cord directly into the AC outlet. Use an AC voltmeter having 1,000 ohms per volt or more sensitivity in the following manner. Connect a 1,500 Ω 10 W resistor paralleled by a 0.15 μF AC-type capacitor between an exposed metal part and a known good earth ground.
     Measure the AC voltage across the resistor with the AC voltmeter.
     Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured must not exceed 0.75 V AC (r.m.s.). This corresponds to 0.5 mA AC (r.m.s.).


AC VOLTMETER
(Having 1000 ohms/volt, or more sensitivity.)
0.15 μF AC TYPE
1500 Ω 10 W
Place this probe on each exposed metal part.
Good earth ground

Warning

1. This equipment has been designed and manufactured to meet international safety standards.
2. It is the legal responsibility of the repairer to ensure that these safety standards are maintained.
3. Repairs must be made in accordance with the relevant safety standards.
4. It is essential that safety critical components are replaced by approved parts
5. If mains voltage selector is provided, check setting for local voltage.

Important for Laser Products

1. CLASS 1 LASER PRODUCT
2. DANGER: Invisible laser radiation when open and interlock failed or defeated. Avoid direct exposure to beam.
3. CAUTION: There are no serviceable parts inside the Laser Unit.
4. CAUTION: Do not disassemble the Laser Unit. Replace the complete Laser Unit if it malfunctions.
5. CAUTION: The compact disc player uses invisible laser radiation and is equipped with safety switches which prevent emission of radiation when the drawer is open and the safety interlocks have failed or are defeated. It is dangerous to defeat the safety switches.
6. CAUTION: If safety switches malfunction, the laser is able to function.
7. CAUTION. Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

VARNING: OSYNLIG LASERSTRÅLNING UPPSTÅR VID KOMPONENTENS ÖPPNING NÄR SÄKERHETSBRYTAREN ÄR FRÅNSLAGEN.

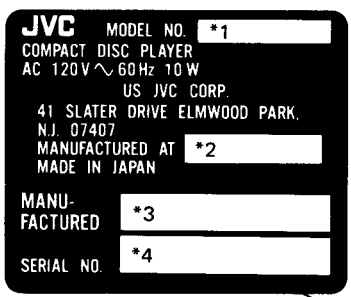
ADVARSEL: USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION.
UNDGÅ UDSÆTTELSE FOR STRÅLING.

ADVARSEL: USYNLIG LASERSTRÅLING VED ÅPNING NÅR SIKKERHETSBRYTEREN ER AVSLOTT.
UNNGÅ UTSETTELSE FOR STRÅLING.

VAROITUS: LAITE SISÄLTÄÄ LASERDIODIN, JOKA LÄHETTÄÄ (NÄKYMÄTÖNTÄ) SILMILLE VAARALLISTA LASERSÄTEILYÄ.

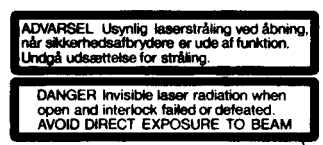
REPRODUCTION AND POSITION OF LABELS

IDENTIFICATION LABEL BY DHHS
(Only for the U.S.A.)

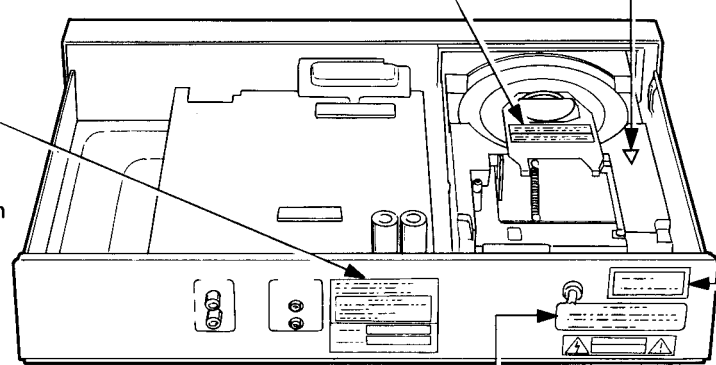


Note:
*1 Model number
*2 Identification code of factory
*3 The date of manufacture
*4 The serial number of production

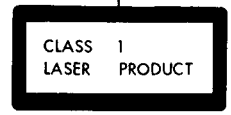
WARNING LABEL


ADVARSEL Usynlig laserstråling ved åbning, når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling.
DANGER Invisible laser radiation when open and interlock failed or defeated. AVOID DIRECT EXPOSURE TO BEAM

HAZARD SYMBOL LABEL
(Only for Continental Europe)

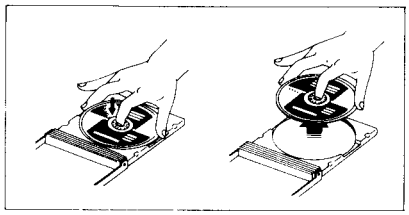


CERTIFICATION LABEL BY DHHS
(Only for the U.S.A.)



CLASSIFICATION LABEL
(Only for Continental Europe, the U.K. and Australia)

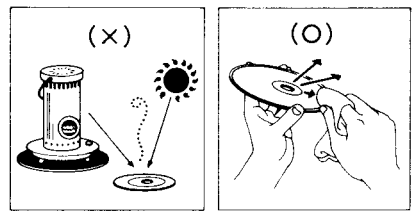
HOW TO HANDLE A COMPACT DISC



Since compact discs are plastic, they can be damaged; if they get dirty, dusty, damaged or warped, the signal will not be picked up correctly, and such discs may cause the player to malfunction. When using a compact disc, take care of the following points.

- Do not touch the surface to be played (reflective silver i.e. the side without the label) when playing or handling the discs.
- **Storage**
  Make sure to keep discs in their cases.
  If discs are piled on top of one another without cases, they may be damaged. Do not put discs in a place exposed to direct sunlight or in a place with high temperature and humidity.
  Especially, avoid leaving discs in your car.
- **Maintenance of discs**
  When fingerprints and dirt adhere to a disc, wipe off with a soft dry cloth.
  If it is difficult to clean, wipe off with a cloth moistened with water.
- Do not use analog record cleaners, benzine, alcohol or antistatic agent.
- Do not damage the label side or stick paper or attach adhesive tape to it.
- In the case of an 8 cm (3") single CD, first place it in the disc hold, for an 8 cm (3") disc, within the tray and play it.

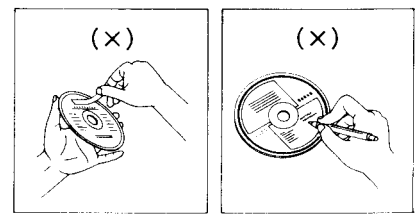
BEHANDLUNG EINER COMPACT-DISC



Da Compact-Discs aus Kunststoff hergestellt sind, können sie leicht beschädigt werden. Bei Beschädigung, Verschmutzung, Staubablagerung oder Deformation kann das Signal nicht korrekt abgelesen werden, wodurch möglicherweise Betriebsstörungen des Players hervorgerufen werden.
Bei Benutzung einer Compact-Disc auf folgende Punkte achten.

- Die Abspielfäche (die silbrig reflektierende bzw. unbedruckte Seite) nicht berühren.
- **Lagerung**
  Eine Compact-Disc stets in der mitgelieferten Schutzhülle aufbewahren.
  Werden Compact-Discs ohne Schutzhülle aufeinander gelagert, können sie beschädigt werden. Compact-Discs niemals direktem Sonnenlicht oder hohen Temperaturen bzw. Feuchtigkeit aussetzen. Compact-Discs nicht im Auto liegen lassen.
- **Pflege von Compact-Discs**
  Fingerabdrücke bzw. Schmutz mit einem weichen und trockenen Tuch abwischen.
  Wenn notwendig ein mit Wasser angefeuchtetes Tuch verwenden.
- Keinerlei Schallplattenreinigungsmittel, Benzin, Alkohol oder Antistatikmittle verwenden.
- Die etikettierte Seite nicht beschädigen oder bekleben.
- Bei der 8 cm (3") SINGLE CD werden zuerst in den Dischalter, welcher für diesen Zweck zur Verfügung steht, gelegt und danach abgespielt.

COMMENT MANIPULER UN DISQUE AUDIONUMERIQUE



Du fait que les disques audionumériques sont en plastique, ils sont facilement endommagés. S'ils sont salis, poussiéreux, endommagés ou voilés, le signal ne sera pas recueilli correctement et de tels disques risquent de provoquer un mauvais fonctionnement du lecteur.
Lorsque vous utilisez un disque audio-numérique, faire attention aux points suivants:

- Ne pas toucher la surface à lire (argent réfléchissant, c'est-à-dire la face sans label) lorsque vous le placez sur l'appareil et le manipulez.
- **Entrepôt**
  Bien placer les disques dans leur boîte. S'ils sont empilés les uns sur les autres sans leur boîte, ils risquent d'être endommagés.
  Ne pas placer les disques à un endroit directement éclairé par le soleil, ou dans un endroit où la température est élevée ou humide.
  Eviter en particulier de laisser les disques dans une voiture.
- **Entretien des disques**
  Si des traces de doigts ou de la poussière adhèrent au disque, l'essuyer avec un chiffon doux et sec.
  S'il est difficile à nettoyer, l'essuyer avec un chiffon imbibé d'eau.
- Ne pas utiliser de produit de nettoyage de disques conventionnels, de benzine, d'alcool ni de produit antistatique.
- Ne pas endommager la face avec le label, ne pas y coller de papier ni de ruban adhésif.
- Lors de l'utilisation d'un disque audio-numérique de 8 cm (3 pouces), le placer dans le porte-disque à 8 cm (3 pouces) créé à cet effet à l'intérieur du plateau.

BEFORE USE

VOR DEM GEBRAUCH

AVANT L'UTILISATION

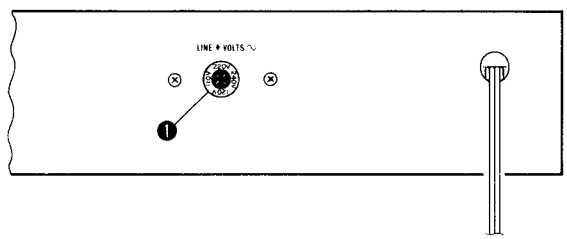


Fig. 3
Abb. 3
Afb. 3

Set the voltage selector ❶ to your local line voltage. (Fig. 3)
When this equipment is used in an area where the supply voltage is different from the preset voltage, reset the voltage selector to the correct position.
(Not provided on units for U.S.A., Canada, Australia, U.K. and Continental Europe.)

Schalten Sie den Spannungswähler ❶ auf Ihre örtliche Netzspannung. (Abb. 3)
Wenn die voreingestellte Netzspannung an diesem Gerät nicht mit der tastächlich vorhandenen übereinstimmt, den Spannungswähler auf den erforderlichen Wert einstellen.
(Nicht vorgesehen an den Geräten, die für die USA, Kanada, Australien, Großbritannien und Kontinental-Europa bestimmt sind.)

Régler le sélecteur de tension ❶ sur votre tension de secteur. (Fig. 3)
Quand cet appareil est utilisé dans une région où la tension secteur est différente de celle qui est préréglée, replacer le sélecteur de tension sur la position correcte.
(Ne figure pas sur les appareils destinés aux Etats-Unis, au Canada, à l'Australie, au Royaume-Uni et à l'Europe Continentale.)

CONNECTION DIAGRAM
ANSCHLUSSDIAGRAMM
DIAGRAMME DES RACCORDEMENTS

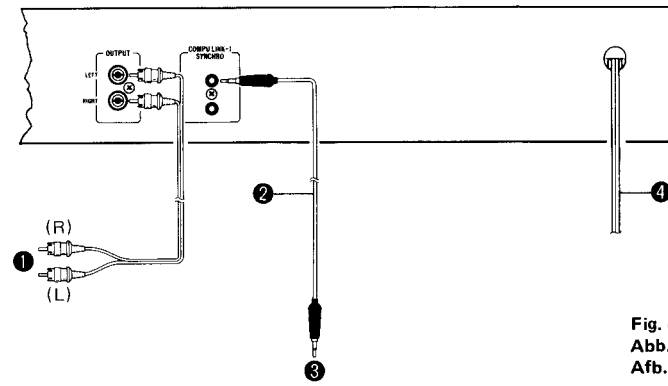


Fig. 4
Abb. 4
Afb. 4

❶ To the input terminal (CD, AUX or TAPE PLAY) of an amplifier.
❷ Provided remote cable
❸ To the "SYNCHRO" terminal of an amplifier or a cassette deck.
❹ To the wall outlet.

■ Connecting to an amplifier

Notes:
- **When connecting any component, set the POWER button to off.**
- **Connect the audio plugs firmly after confirming the L (Left) and R (Right).**

Connect the OUTPUT terminals of the player to the input terminals (CD, AUX or TAPE PLAY) of the amplifier with the provided audio cable as shown in Fig. 4.
(Do not connect to the PHONO terminals of the amplifier.)

■ Connecting to a cassette deck etc.

Connect the COMPU LINK-1/SYNCHRO terminals of this unit to the COMPU LINK-1/SYNCHRO terminals of an amplifier, cassette deck, etc. to generate COMPU LINK Control System. Concerning compatible amplifiers or cassette decks, consult your dealer.

■ COMPU LINK CONTROL SYSTEM

This is a convenient system which has been originated and developed by JVC. The following are the brief explanations of its major performances:

Automatic Source Selection
When the provided with this unit remote cables are used for connecting this unit to other components which have COMPU LINK-1/SYNCHRO terminals, the switch-over of all system components is possible with simple one-touch of the source selector button of JVC's amplifier or receiver. By doing this, the corresponding component will start playing automatically. The source select button of the remote control unit or the activation button of the desired component may also be used for this purpose. When the components have been switched over, the previous component will stop playing within five seconds.

❶ Zum Eingangsanschluß (CD, AUX, oder TAPE PLAY) das Verstärkers.
❷ Mitgeliefertes Fernbedienkabel
❸ Zum "SYNCHRO" Anschluß eines Verstärkers oder eines Cassettendecks.
❹ Zur Netzsteckdose.

■ Anschluß an einen Verstärker

Hinweise:
- **Bei Anschlüssen aller Art die Netzspannung ausschalten.**
- **Schließen Sie die Audio-Verbindungsstecker korrekt an dis Buchsen L (Links) und R (Rechts) an.**

Die OUTPUT-Buchsen des Players über die mitgelieferten Audio-Kabel mit den Eingangsbuchsen des Verstärkers (CD, AUX oder TAPE PLAY) verbinden, wie in Abb. 4 geziegt.
(Nicht an den PHONO-Buchsen des Verstärkers anbringen!)

■ Anschluß an ein Cassettendeck u.s.w.

Die COMPU LINK-1/SYNCHRO-Buchsen dieses Geräts an die COMPU LINK-1/SYNCHRO-Buchsen eines Verstärkers, Cassettendecks o.a. anschließen, um das COMPU LINK Bedienungssystem zu aktivieren. Ihr Audio-Händler kann Ihnen die Kompatible Geräte vorführen.

■ COMPU LINK BEDIENUNGSSYSTEM

Dieses bedienungsfreundliche System ist bei JVC erfunden und entwickelt worden. Es folgen kurze Erläuterungen seiner Eigenschaften:

Automatische Quellenwahl
Wenn die mitgelieferten Verbindungskabel zum Anschluß dieses Geräts an andere Komponenten verwendet werden, die mit COMPU LINK-1/SYNCHRO-Anschlußbuchsen ausgestattet sind, dann lassen sich sämtliche Bauteile mit einem einzigen Druck auf die Quellenwahltaste des JVC-Verstärkers oder -Receivers umschalten. Das entsprechende Gerät beginnt dann automatisch zu spielen. Die Quellenwahltaste der Fernbedienung oder die Auslösetaste der gewünschten Komponente kann ebenso dazu verwendet werden. Wenn die Komponenten umgeschaltet sind, wird der Wiedergabebetrieb des vorigen Bauteils innerhalb fünf Sekunden abgebrochen.

❶ Vers la borne d'entrée (CD, AUX ou TAPE-PLAY) d'un amplificateur.
❷ Câble de télécommande fourni
❸ Vers la borne "SYNCHRO" d'un amplificateur ou d'une platine d'enregistrement.
❹ Vers une prise secteur.

■ Raccordement à un amplificateur

Remarques:
- **Lors du raccordement à un autre appareil, placer la touche POWER sur la position d'arrêt.**
- **Raccorder solidement la fiche audio après avoir vérifié le L (gauche) et le R (droite).**

Raccorder les bornes OUTPUT du lecteur aux bornes d'entrée (CD, AUX ou TAPE PLAY) de l'amplificateur avec le câble d'audio fourni comme indiqué à la figure 4.
(Ne pas raccorder aux bornes "PHONO" de l'amplificateur.)

■ Raccordement à une platine d'enregistrement, etc.

Raccorder les prises de synchronisation (COMPU LINK-1/SYNCHRO) de cet appareil aux prises de synchronisation (COMPU LINK-1/SYNCHRO) d'un amplificateur, platine à cassettes, etc. afin d'utiliser le système de commande COMPU LINK. Prendre contact avec un revendeur pour savoir quels amplificateurs ou platines à cassettes sont compatibles.

■ SYSTEME DE COMMANDE COMPU LINK

Il s'agit d'un système très pratique qui a été conçu et développé par JVC. Les lignes suivantes donnent de brèves explications sur ses caractéristiques principales:

Sélection automatique de source d'entrée
Lorsqu'on utilise les câbles de télécommande fournis pour raccorder cet appareil aux autres éléments équipés de bornes de synchronisation (COMPU LINK-1/SYNCHRO), il est possible de passer d'un élément à l'autre en appuyant tout simplement sur une touche du sélecteur d'entrée de l'amplificateur ou de l'amplificateur-tuner JVC. En procédant ainsi, la lecture commence automatiquement sur l'élément correspondant.
Une fois la commutation des éléments effectuée, la lecture qui était en cours sur l'élément précédent s'arrête dans les cinq secondes qui suivent.

Synchronized Recording

Synchronized recording refers to the process in which the cassette deck starts recording in synchronism with the CD player. Perform synchronized recording as follows.

1. Set the cassette deck to the REC/PAUSE mode in accordance with the procedures in the instruction manual.
2. If you want the programmed recording, program the desired tunes in any order you wish to hear.
3. Press the PLAY/PAUSE button of the CD player. By so doing, the cassette deck is placed in the record mode and synchronized with the CD player for recording. Synchronized recording can be made.

Notes:

- **Synchronized recording stops automatically when the CD player stops playing.**
- **To cancel synchronized recording, press the STOP button of the CD player or cassette deck.**
- **Press the REC and PLAY buttons of the cassette deck when starting in the middle of play.**
- **During synchronized recording, the operation of the PLAY/PAUSE button is interlocked with the cassette deck.**
- **When the REC/PAUSE mode is set by pressing PAUSE button after pressing the REC and PLAY buttons simultaneously, synchronized recording is not possible. For details, refer to the instruction manual of the cassette deck.**
- **Abnormal operation will result if the power supply of the component(s) is interrupted midway. If this happens, press the activation button again to restart.**
- **Ensure that the COMPU LINK-1/SYNCHRO terminals of individual components are connected with the provided remote cables. Also be sure to read the instruction manual for each component very carefully.**
- **The source is locked to the CD position during synchronized recording to avoid accidental stops or switch-over to another component. To switch over the components, cancel synchronized recording first.**

Synchronisierte Aufnahme

Synchronisierte Aufnahme ist ein Vorgang, wo das Cassettendeck seinen Aufnahmebetrieb gleichzeitig mit dem CD-Player aufnimmt. Synchronaufnahmen wie folgend durchführen.

1. Das Cassettendeck gemäß den Anweisungen der Bedienungsanleitung auf Betrieb REC/PAUSE stellen.
2. Für vorprogrammierte Aufnahmen die aufzunehmenden Stücke in der gewünschten Reihenfolge einprogrammieren.
3. Die PLAY/PAUSE-Taste des CD-Players drücken. Das Cassettendeck wird dadurch auf Aufnahmebetrieb geschaltet und für synchrone Aufnahmen vom CD-Player bereitgestellt.

Hinweise:

- **Die Synchronaufnahme wird automatisch abgebrochen, wenn sich der CD-Player abschaltet.**
- **Zum Ausschalten einer Synchronaufnahme die STOP-Taste am CD-Player oder Cassettendeck drücken.**
- **Für Aufnahmen, die in der Plattenmitte beginnen sollen, sind die Tasten REC und PLAY am Cassettendeck zu betätigen.**
- **Während Synchronaufnahmen ist die Funktion der Taste PLAY/PAUSE mit dem Cassettendeck zusammengeschaltet.**
- **Wenn man nach gleichzeitigem Betätigen der Tasten REC und PLAY auf Betrieb REC/PAUSE schaltet, indem man die PAUSE-Taste drückt, dann ist keine synchrone Aufnahme möglich. Einzelheiten dazu entnehmen Sie bitte der Bedienungsanleitung des Cassettendecks.**
- **Es kommt zu Betriebsstörungen, wenn die Stromversorgung eine oder mehrerer Anlagenteile unterbrochen wird. In solch einem Fall ist zum Neustart die Auslösetaste zu drücken.**
- **Versichern Sie sich, daß die COMPU LINK-1/SYNCHRO-Buchsen einzelner Anlagenteile mit den vorgesehenen Verbindungskabeln versehen sind. Ebenfalls nicht versäumen, die Bedienungsanleitungen der einzelnen Geräte sorgfältig durchzulesen.**
- **Die Aufnahmequelle ist während der Synchronaufnahme auf die CD-Position festgeschaltet, um ungewolltes Unterbrechen oder Umschalten auf eine andere Anlagenkomponente zu verhindern. Vor dem Umschalten auf ein anderes Gerät ist die Synchronaufnahme daher zuerst abzuschalten.**

Enregistrement synchronisé

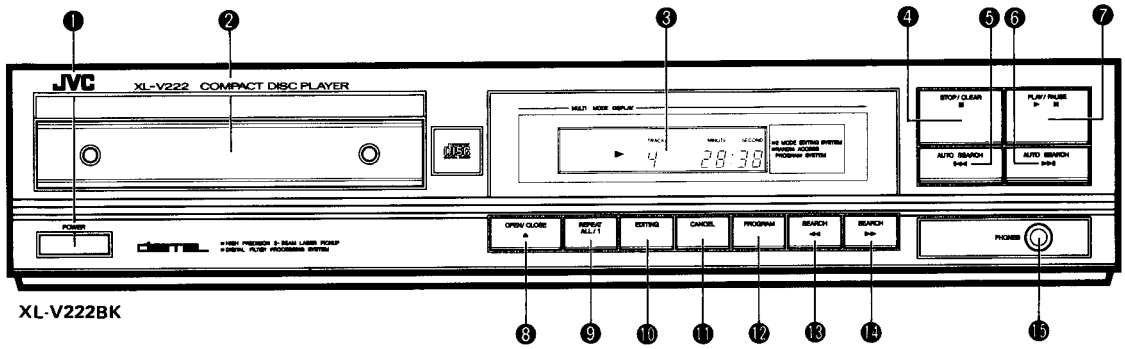
L'enregistrement synchronisé permet de faire démarrer l'enregistrement sur la platine à cassettes en synchronisation avec la lecture sur le lecteur de disques audionumériques. Procéder de la manière suivante pour effectuer un enregistrement synchronisé.

1. Placer la platine à cassettes dans le mode de pause à l'enregistrement (REC/PAUSE) en suivant les instructions données dans son mode d'emploi.
2. Si l'on désire enregistrer des morceaux programmés, programmer les morceaux désirés dans l'ordre voulu.
3. Appuyer sur la touche de lecture/pause (PLAY/PAUSE) du lecteur CD. La platine à cassettes passe dans le mode d'enregistrement et l'enregistrement s'effectue en synchronisation avec la lecture qui s'effectue sur le lecteur CD. C'est ainsi que l'enregistrement synchronisé est possible.

Remarques:

- **L'enregistrement synchronisé s'arrête dès que la lecture s'arrête sur le lecteur CD.**
- **Pour annuler le mode d'enregistrement synchronisé, appuyer sur la touche d'arrêt (STOP) du lecteur CD ou de la platine à cassettes.**
- **Appuyer sur les touches d'enregistrement (REC) et de lecture (PLAY) pour commencer l'enregistrement au milieu d'un morceau.**
- **Pendant l'enregistrement synchronisé, une action sur la touche de lecture/pause (PLAY/PAUSE) du lecteur CD agit aussi sur la platine à cassettes.**
- **Lorsqu'on place la platine à cassettes en mode de pause à l'enregistrement (REC/PAUSE) en appuyant sur la touche de PAUSE après avoir appuyé simultanément sur les touches d'enregistrement (REC) et de lecture (PLAY), l'enregistrement synchronisé n'est pas possible. Se reporter au mode d'emploi de la platine à cassettes pour plus de détails.**
- **Le fonctionnement sera anormal si la tension disparaît sur un ou plusieurs des éléments au milieu de l'utilisation. Si un tel cas se produit, appuyer une nouvelle fois sur la touche de mise en marche pour recommencer.**
- **S'assurer que les bornes de synchronisation (COMPU LINK-1/SYNCHRO) des différents éléments sont bien raccordées à l'aide des câbles de télécommande fournis. De même, s'assurer de lire très attentivement le mode d'emploi de chacun des éléments.**
- **Le sélecteur d'entrée est verrouillé sur la position CD pendant l'enregistrement synchronisé, ceci permet d'éviter toute interruption accidentelle ou tout basculement de la source d'entrée sur un autre élément. Il faut d'abord annuler le mode d'enregistrement synchronisé pour pouvoir choisir une autre source d'entrée.**

DESCRIPTION AND FUNCTIONS
BESCHREIBUNG UND FUNKTIONEN
DESCRIPTION ET FONCTIONS



XL-V222BK

Fig. 7
Abb. 7
Afb. 7

❶ POWER
Press to switch the POWER on, and the display lights. Press again to switch the POWER off, and the display goes off.

❷ Disc platter
Load the disc to be played.
While the disc is moving, do not turn the power off or push the disc platter by hand, etc.

❸ Display
This shows various program data including playing time, tune number, etc. For more details, see "DISPLAY" on page 25.

❹ STOP (■)/CLEAR
Press this button once to stop playing and twice to erase the programmed tunes.

❺ AUTO SEARCH (⏮) (backward)
Press once during play to return the sensor to the start of the current tune. Press twice to return the sensor to the start of the previous tune. Each time it is pressed, the sensor moves backward by one tune. Keep pressing this button to return to the beginning of the disc.

❻ AUTO SEARCH (⏭) (forward)
Press once during play to move the sensor to the start of the next tune. Each time it is pressed, the sensor moves forward by one tune.

❼ PLAY (▶)/PAUSE (⏸)
Press this button to start play from the first tune or the programmed play after the loading of a disc is finished. Press this button again to suspend play temporarily, the PAUSE indicator lights. To restart playing, press this button again.

❽ OPEN/CLOSE (⏏)
Press to move the disc platter in and out. Press once and the disc platter will move out; load a disc and press again to move the platter in. The disc is now ready to be played.
If it is pressed during play, play is interrupted. The program is erased from memory and the disc platter comes out.

❶ Netz (POWER)
Beim Einschalten der Netzspannung leuchtet die Anzeige auf. Bei erneutem Druck wird die Netzspannung ausgeschaltet, und die Anzeige erlischt.

❷ Disc-Halter
Legen Sie die gewünschte Disc ein.
Solange die Disc läuft, darf die Netzspannung nicht ausgeschaltet oder der Disc-Halter mit der Hand angehalten werden.

❸ Display
Das Display informiert über verschiedene Programmierdaten, inkl. Wiedergabezeit, Titelnummer etc.. Weitere Angaben im Abschnitt "DISPLAY" auf Seite 25.

❹ STOP (■)/CLEAR-Taste
Taste einmal drücken, um die Wiedergabe abzubrechen, bzw. zweimal, um die vorprogrammierten Titel zu löschen.

❺ Autom. Suchlauf (AUTO SEARCH ⏮) (rückwärts)
Während der Wiedergabe einmal drücken, um den Abnehmer zum Anfang des laufenden Titels zurückzuführen. Zweimal drücken, um den Abnehmer zum Anfang des vorigen Titels zurückzuführen. Bei jedem Tastendruck wird der Abnehmer um einen Titel zurückgeführt. Wenn Sie die Taste gedrückt halten, springt der Abnehmer immer weiter bis zum Plattenanfang zurück.

❻ Autom. Suchlauf (AUTO SEARCH ⏭) (vorwärts)
Während der Wiedergabe wird der Abnehmer durch einmaliges Betätigen dieser Taste jeweils zum Anfang des folgenden Titels gesetzt. Jedes Betätigen der Taste setzt den Abnehmer um einen Titel weiter.

❼ Wiedergabe/Pause-Taste (PLAY ▶ /PAUSE ⏸)
Diese Taste betätigen, um die Wiedergabe vom ersten Titel an oder die programmierte Wiedergabe zu starten, nachdem der Ladevorgang beendet ist. Bei nochmaligem Betätigen dieser Taste wird die Wiedergabe zeitweilig unterbrochen; das PAUSE Zeichen leuchtet auf. Zur Fortsetzung der Wiedergabe diese Taste nochmals betatigen.

❽ Öffnen/Schließen (OPEN/CLOSE ⏏)
Den Disc-Halter hiermit aus- und einfahren. Wenn Sie die Taste einmal betätigen, fährt der Disc-Halter heraus; legen Sie nun eine Disc ein, und betätigen Sie die Taste erneut, um den Disc-Halter einzufahren. Die Platte ist nun abspielbereit.
Wenn Sie die Taste während der Wiedergabe drücken, wird der Betrieb unterbrochen, das Spielprogramm wird gelöscht, und der Disc-Halter fährt aus.

❶ Interrupteur d'alimentation (POWER)
Appuyer sur cet interrupteur pour mettre l'appareil sous tension, l'affichage s'allume. Appuyer une nouvelle fois sur cet interrupteur pour mettre l'appareil hors tension, l'affichage s'éteint.

❷ Plateau du disque
Y placer le disque à lire.
Quand le plateau se déplace, ne pas couper l'alimentation ni pousser le plateau à la main, etc.

❸ Affichage
Il indique de nombreuses données de programmes y compris la durée de lecture, le numéro du morceau, etc. Pour plus de détails, voir "AFFICHAGE", page 25.

❹ Touche d'arrêt/effacement (STOP ■ / CLEAR)
Appuyer une fois sur cette touche pour arrêter la lecture et deux fois pour effacer les morceaux programmés.

❺ Touche de recherche automatique (AUTO SEARCH) (⏮) (arrière)
L'enfoncer une fois pendant la lecture pour faire revenir le détecteur au début du morceau actuel. L'enfoncer deux fois pour faire retourner le détecteur au début du morceau précédent. A chaque pression, le détecteur retourne en arrière d'un morceau. Continuer à appuyer sur cette touche pour retourner au commencement du morceau précédent.

❻ Touche de recherche automatique (AUTO SEARCH) (⏭) (avant)
L'enfoncer une fois pendant la lecture pour faire déplacer le détecteur jusqu'au début du morceau suivant. A chaque pression, le détecteur se déplace en avant d'un morceau.

❼ Touche de lecture/pause (PLAY ▶ /PAUSE ⏸)
L'enfoncer pour commencer la lecture à partir du premier morceau ou la lecture programmée après que la charge du disque soit terminée. La réenfoncer pour arrêter momentanément la lecture: PAUSE s'allume. Pour reprendre la lecture, réenfoncer.

❽ Touche d'ouverture/fermeture (OPEN/CLOSE ⏏)
L'enfoncer pour faire entrer et sortir le plateau. Par une pression, le plateau sort: mettre un disque en place, puis réenfoncer pour faire entrer le plateau. Le disque est alors prêt à être lu.
Si elle est enfoncée pendant la lecture, celle-ci est interrompue, le programme est effacé de la mémoire et le plateau du disque sort.

⑨ REPEAT ALL/1
Press this button to play one selection, all the selections, or the programmed selections of the disc repeatedly.
In case of all the selections, press the button once and play starts with "ALL" and "REPEAT" lit in the display window. In case of one selection, press the button twice and play starts with "1" and "REPEAT" lit in the display window.
To release this repeat play, press the [REPEAT ALL/1] button again.

⑩ EDITING
Press this button when edit recording. Refer to page 23 for details.

⑪ CANCEL
Press this button to cancel a programmed tune. Each time it is pressed, one tune is cancelled starting from the last tune.

⑫ PROGRAM
Press this button to program tunes.
The PROGRAM indicator lights when programming or playing back programmed tunes.

⑬ SEARCH (◀◀)*
Press this button while in the play or pause mode to scan backward. When this button is pressed continuously, the CD player does the backward-search slowly for about 3 seconds and then continues at a higher speed.

⑭ SEARCH (▶▶)*
Press this button while in the play or pause mode to scan backward. When this button is pressed continuously, the CD player does the forward-search slowly for about 3 seconds and then continues at a higher speed.

* While you are pressing the [SEARCH (◀◀)] or [SEARCH (▶▶)] button during play, you can hear the slight sound reproduction. With this sound reproduction, you can monitor selections.

⑮ PHONES (XL-V222BK only)
Connect head-phone plug.

⑨ Wiederholung (REPEAT ALL/1)
Diese Taste betätigen, um einen Titel, sämtliche Titel oder die programmierten Titel einer Compact Disc zu Wiederholen. Falls alle Titel Wiederholt werden sollen, drücken Sie die Taste einmal. Im Display erscheint die Anzeige "All" und "Repeat". Falls nur ein Titel wiederholt werden soll, drücken Sie die Taste zweimal. Im Display erscheint die Anzeige "Repeat" und "1". Um die Wiederholung aufzuheben, drücken Sie die Taste [REPEAT ALL/1] noch einmal.

⑩ Aufnahmevorbereitung/Aufnahme (EDITING)
Zur Bestimmung des Aufnahmeprogramms diese Taste betätigen. Einzelheiten finden Sie auf Seite 23.

⑪ Löschen (CANCEL)
Mit dieser Taste können Sie den angezeigten Programmwahltitel löschen. Beginnend mit dem jeweils letzten Titel wird mit jedem Tastendruck ein Titel gelöscht.

⑫ Programmtaste (PROGRAM)
Diese Taste betätigen, um Titel zu programmieren.
Bei Programmierung oder Wiedergabe programmierter Titel leuchtet die PROGRAM Anzeige auf.

⑬ Suchlauf (SEARCH ◀◀)*
Während der Wiedergabe oder Pause diese Taste betätigen, um rückwärts abzusuchen. Dauerndes Drücken dieser Taste läßt den CD-Plattenspieler etwa 3 Sekunden lang langsam rückwärts suchen und dann in schnellerem Suchlauf fortfahren.

⑭ Suchlauf (SEARCH ▶▶)*
Während der Wiedergabe oder Pause diese Taste betätigen, um vorwärts abzusuchen. Dauerndes Drücken dieser Taste läßt den CD-Plattenspieler etwa 3 Sekunden lang langsam vorwärts suchen und dann in schnellerem Suchlauf fortfahren.

* Wenn Sie die [SEARCH (◀◀)] oder [SEARCH (▶▶)] -Taste während der Wiedergabe gedrückt halten, können Sie den Ton schwach hören. Damit ist das Auffinden der zur Wiedergabe gesuchten Stello möglich.

⑮ Kopfhörer (PHONES) (XL-V222BK)
Zum Anschluß des Kopfhörerkabels.

⑨ Répétition (REPEAT ALL/1)
Appuyer sur cette touche pour lire une sélection, toutes les sélections ou les sélections programmées du disque à plusieurs reprises.
Dans le cas de toutes les sélections, appuyer sur la touche une fois et la lecture démarre avec "ALL" et "REPEAT" allumés sur la fenêtre d'affichage. Dans le cas d'une sélection, appuyer sur la touche deux fois et la lecture démarre avec "1" et "REPEAT" allumés sur la fenêtre d'affichage.
Pour annuler cette lecture répétée, appuyer de nouveau sur la touche [REPEAT ALL/1].

⑩ Touche d'édition (EDITING)
Appuyer sur cette touche lors de l'enregistrement d'édition. Se reporter à la page 23 pour plus de détails.

⑪ Touche d'annulation (CANCEL)
Appuyer sur cette touche pour annuler un morceau programmé. A chaque pression, un morceau est annulé en commençant par le dernier morceau.

⑫ Touche de programme (PROGRAM)
L'enfoncer pour programmer les morceaux. L'indicateur PROGRAM s'allume lors de la programmation ou de la programmation ou de la lecture des morceaux programmés.

⑬ Recherche (SEARCH ◀◀)*
Appuyer sur cette touche pendant le mode lecture ou pause pour effectuer une recherche vers l'arrière. Quand on maintient cette touche enfoncée, l'appareil effectue la recherche vers l'arrière lentement pendant environ trois secondes puis continue plus rapidement.

⑭ Recherche (SEARCH ▶▶)*
Appuyer sur cette touche pendant le mode lecture ou pause pour effectuer une recherche vers l'avant. Quand on maintient cette touche enfoncée., l'appareil effectue la recherche vers l'avant lentement pendant environ trois secondes puis continue plus rapidement.

* Qunad on appuie sur la [SEARCH (◀◀)] ou [SEARCH (▶▶)] touche pendant la lecture, une faible reproduction sonore est audible. Cette reproduction sonore permet de contrôler les sélections.

⑮ Ecouteurs (PHONES) (XL-V222BK seulement)
Pour brancher les écouteurs.

HOW TO OPERATE

Normal play

1. Set the source selector of your amplifier to correspond to the terminals to which the player is connected (CD, AUX or TAPE PLAY).
2. Press the [POWER] button.
3. Press the [OPEN/CLOSE (⏏)] button to move out the platter.
4. Load a disc with its label up.
   Make sure the disc fits correctly on the platter.

5-1. Press the [PLAY (▶)/PAUSE (⏸)] button. The platter moves into the player automatically and play starts from the first tune. Or,

5-2. Press the [OPEN/CLOSE (⏏)] button to display the table of contents of the disc for about 3 seconds. After this, press the [PLAY (▶)/PAUSE (⏸)] button.

5-3. Press the [AUTO SEARCH (▶▶|)] button until the required track number is displayed, then press the [PLAY (▶)/PAUSE (⏸)] button to start play.

6. During play, the track number and the elapsed time of the selection being played are shown in the display window.
7. When play is finished, the laser pickup moves back to the first tune, and play automatically stops with the operation held in standby.

Note:

- **While the disc platter is moving, do not turn the power off or push the disc platter by hand, etc.**

REMOTE CONTROL OPERATION

If this CD player is connected to a COMPU LINK SYSTEM, it can be controlled by the COMPU LINK SYSTEM's remote control unit.

To designate the desired track numbers or establish the time interval during the tape editing, use this button. If the desired number is 10 or less, use the [1] - [10] buttons. However, to assign a track number over 10, use the [+10] button and the [1] - [10] buttons.

Examples ([1] - [10] buttons)

1. To assign the 25th track, press [+10] button twice and press the [5] button.
2. To assign the 30 minutes, press [+10] button twice and press the [10] button.

To stop play

- Press the [STOP (■)/CLEAR] button; play stops and the player enters the standby mode. (The condition when a disc has been loaded and its contents have been read.)
- To remove the disc, press the [OPEN/CLOSE (⏏)] button. After removal of the disc, press the [OPEN/CLOSE (⏏)] button again to retract the disc platter.

BEDIENUNG

Normale Wiedergabe

1. Den Tonquellenwahlschalter des Verstärkers entsprechend dem für den Player gewählten Anschluß einstellen (CD, AUX oder TAPE PLAY).
2. Die POWER -Taste betätigen.
3. Die [OPEN/CLOSE (⏏)] -Taste betätigen, um den Disc-Halter auszufahren.
4. Eine Compact-Disc mit nach oben zeigendem Etikett einlegen.
   Auf korrekten Sitz der Compact-Disc achten.

5-1. Die [PLAY (▶)/PAUSE (⏸)] -Taste betätigen. Der Disc-Halter wird eingefahren, und die Wiedergabe startet vom ersten Titel an.
   Oder:

5-2. Betätigen Sie Taste [OPEN/CLOSE (⏏)], um etwa 3 Sekunden lang die Titelliste der Disc anzuzeigen. Danach drücken Sie Taste [PLAY (▶)/PAUSE (⏸)].

5-3. Drücken Sie auf Taste [AUTO SEARCH (▶▶|)], bis die gewünschte Titelnummer angezeigt wird, und betätigen Sie dann Taste [PLAY (▶)/PAUSE (⏸)], um mit der Wiedergabe zu beginnen.

6. Während der Wiedergabe werden Nummer und verstrichene Zeitspanne des laufenden Titels im Anzeigefenster angegeben.
7. Nach Ende der Wiedergabe kehrt der Laser-Tonabnehmer selbsttätig zum ersten Titel zurück, und die Wiedergabe wird abgebrochen, wobei das Gerät in Betriebsbereitschaft bleibt.

Hinweis:

- **Solange sich der Disc-Halter bewegt, die Spannungsversorgung nicht abschalten, den Disc-Halter nicht von Hand bewegen etc.**

BEDIENUNG DES FERNBEDIENUNGSTEILS

Wenn der CD-Player an ein COMPU LINK-SYSTEM angeschlossen ist, kann er mittels des Fernbedienungsteils des COMPU LINK-SYSTEMS gesteuert werden.

Diese Taste zur Eingabe der gewünschten Titelnummern oder Einstellung der Zeitspanne bei der Bandaufnahme betätigen. Falls die gewünschte Titelnummer 10 oder weniger ist, die Tasten ([1]-[10]) verwenden. Zum Eingeben einer Titelnummer über 10 verwendet man die [+10] Taste und die entsprechende Taste [1]-[10].

Beispiel ([1]-[10] betätigen)

1. Zur Eingabe des 25. Titels Taste [+10] zweimal drücken und Taste [5] betätigen.
2. Zur Eingabe von 30 Minuten Taste [+10] zweimal drücken und Taste [10] betätigen.

Beenden der Wiedergabe

- Die [STOP (■)/CLEAR]-Taste betätigen; die Wiedergabe wird beendet, und der Player wird auf Betriebsbereitschaft geschaltet (Der gleiche Status wie nach Einlegen einer Disc und Ablesen des Disc-Inhalts.)
- Zum Entnehmen der Disc die [OPEN/CLOSE (⏏)]-Taste betätigen. Nach Entnehmen der Disc nochmals die [OPEN/CLOSE (⏏)]-Taste betätigen, um den Disc-Halter wieder einzufahren.

FONCTIONNEMENT

Lecture normale

1. Placer le sélecteur de source de votre amplificateur pour qu'il corresponde aux bornes sur lesquelles le lecteur est raccordé (CD, AUX ou TAPE PLAY).
2. Enfoncer la touche [POWER].
3. Enfoncer la touche [OPEN/CLOSE (⏏)] pour faire sortir le plateau.
4. Placer un disque avec son label vers le haut. S'assurer qu'il est bien placé sur le plateau.

5-1. Enfoncer la touche [PLAY (▶)/PAUSE (⏸)]. Le plateau entre automatiquement dans le lecteur et la lecture commence à partir du premier morceau. Ou,

5-2. Appuyer sur la touche [OPEN/CLOSE (⏏)] pour afficher le contenu du disque pendant environ 3 secondes. Après cela, appuyer sur la touche [PLAY (▶)/PAUSE (⏸)].

5-3. Appuyer sur la touche [AUTO SEARCH (▶▶|)] jusqu'à ce que le numéro de piste désiré soit affiché. Puis, appuyer sur la touche [PLAY (▶)/PAUSE (⏸)] pour commencer la lecture.

6. Pendant la lecture, le numéro de morceau et le temps écoulé pour la sélection en cours de lecture sont indiqués sur la fenêtre d'affichage.
7. Lorsque la lecture est terminée, le capteur laser revient au début du premier morceau et la lecture s'arrête automatiquement. L'appareil passe en mode d'attente.

Remarque:

- **Quand le plateau bouge, ne pas couper l'alimentation ni pousser le plateau à la main, etc.**

FONCTIONNEMENT TELECOMMANDE

Si ce lecteur audionumérique est connecté à un système de liaison informatisé (COMPU LINK SYSTEM), il peut être contrôlé par la télécommande de ce système.

Pour désigner les numéros de morceau désirés ou pour établir l'intervalle de temps lors d'un enregistrement avec montage, utiliser ces touches. Si le numéro désiré est 10 ou moins, utiliser les touches [1] - [10]. Toutefois, pour affecter un numéro de morceau supérieur à 10, utiliser la touche [+10] et ces touches [1] - [10].

Exemples (touches [1] - [10])

1. Pour affecter le 25ème morceau, appuyer deux fois sur la touche [+10] puis sur la touche 5.
2. Pour affecter un temps de [30] minutes, appuyer deux fois sur la touche [+10] puis sur la touche [10].

Pour arrêter la lecture

- Enfoncer la touche [STOP (■)/CLEAR]; la lecture s'arrête et le lecteur entre en mode d'attente. (Condition quand un disque a été inséré prêt à être lu et que son contenu a été analysé.)
- Pour retirer le disque, enfoncer la touche [OPEN/CLOSE (⏏)]. Après avoir retiré le disque réenfoncer la touche [OPEN/CLOSE (⏏)] pour que le plateau se rétracte.

To stop play temporarily

1. Press the [PLAY (▶)/PAUSE (❚❚)] button. The PAUSE indicator lights and play stops with the pick in the same position.
2. The [AUTO SEARCH (⏮)], [AUTO SEARCH (⏭)] buttons and the manual search operation can be performed in the pause mode.

- To use the manual search function, press the [SEARCH (◀◀)], [SEARCH (▶▶)] buttons and scan to the desired position while watching the time display. When the required time is displayed, press the [PLAY (▶)/PAUSE (❚❚)] button.

3. To restart play, press the [PLAY (▶)/PAUSE (❚❚)] button. The PAUSE indicator will go out.

To scan to another tune during play

- Press the [AUTO SEARCH (⏭)] button to advance to the next tune. Press the [AUTO SEARCH (⏮)] button once to restart play from the start of the current tune. To start play from the previous tune, **press the [AUTO SEARCH (⏮)] button twice.**
- Since each time the [AUTO SEARCH (⏮)], [AUTO SEARCH (⏭)] buttons are pressed, the pickup moves forward or backward in steps of one tune. Press them the required number of times. In addition, keep pressing these buttons to return/proceed to the requested tune.

Repeat Play

- Press the [REPEAT ALL/1] button. The REPEAT ALL indicator lights and all the selections or all the programmed selections of the disc can be played back repeatedly. If the [REPEAT ALL/1] button is pressed again, "REPEAT 1" appears in the display window and one designated selection will be played back repeatedly. To release the repeat play, press the [REPEAT ALL/1] button again.

Zur zeitweisen Unterbrechung der Wiedergabe

1. Betätigen Sie Taste [PLAY (▶)/PAUSE (❚❚)]. Die PAUSE-Anzeige leuchtet auf, und die Wiedergabe wird unterbrochen, wobei der Abnehmer in Position bleibt.
2. Manueller Suchbetrieb und Tasten [AUTO SEARCH (⏮)] und [AUTO SEARCH (⏭)] lassen sich auch während Pause-Betrieb bedienen.

- Bei manuellem Suchlauf die [SEARCH (◀◀)], [SEARCH (▶▶)]-Tasten drücken, und den Suchlauf zur gewünschten Position unter Beobachtung der Zeitanzeige durchführen. Bei Erreichen der gewünschten Zeitposition die [PLAY (▶)/PAUSE (❚❚)]-Taste drücken.

3. Zur Fortsetzung der Wiedergabe die [PLAY (▶)/PAUSE (❚❚)]-Taste drücken, worauf das PAUSE Zeichen erlischt.

Suchlauf während der Wiedergabe zu einem anderen Titel

- Betätigen Sie Taste [AUTO SEARCH (⏭)], um zum nächsten Titel vorzuspringen. Drücken Sie einmal auf Taste [AUTO SEARCH (⏮)], um mit der Wiedergabe vom Anfang des gegenwärtigen Titels zu beginnen. Wenn Sie den vorausgehenden Titel abspielen wollen, **drücken Sie Taste [AUTO SEARCH (⏮)] zweimal.**
- Bei jedem Tastendruck auf [AUTO SEARCH (⏮)] oder [AUTO SEARCH (⏭)] bewegt sich der Abnehmer um jeweils einen Titel vor oder zurück. Betätigen Sie die Taste also entsprechend oft, oder halten Sie die Taste solange gedrückt, bis der gewünschte Titel erscheint.

Wiederholung der Wiedergabe

- Drücken Sie Taste [REPEAT ALL/1]. Die Anzeige REPEAT ALL leuchtet auf, und alle Titel oder alle ins Spielprogramm aufgenommenen Titel der Compact Disc lassen sich wiederholt abspielen. Wenn Sie die Taste [REPEAT ALL/1] noch einmal betätigen, erscheint im Anzeigefenster "REPEAT 1", und ein eingegebener Titel wird wiederholt, und zwar so lange, bis Sie die Taste [REPEAT ALL/1] erneut drücken.

Pour arrêter momentanément la lecture

1. Appuyer sur la touche [PLAY (▶)/PAUSE (❚❚)]. L'indicateur PAUSE s'allume, puis la lecture s'arrête avec le senseur dans la même position.
2. Les touches [AUTO SEARCH (⏮)], [AUTO SEARCH (⏭)] et la recherche manuelle peuvent être actionnées dans le mode de pause.

- Pour utiliser la fonction de recherche manuelle, enfoncer les touches [SEARCH (◀◀)], [SEARCH (▶▶)] et balayer jusqu'à la position voulue tout en observant l'affichage de la durée. Quand la durée voulue est affichée, enfoncer la touche [PLAY (▶)/PAUSE (❚❚)].

3. Pour reprendre la lecture, enfoncer la touche [PLAY (▶)/PAUSE (❚❚)]. PAUSE va s'éteindre.

Pour passer à un autre morceau pendant la lecture

- Enfoncer la touche [AUTO SEARCH (⏭)] pour commencer la lecture depuis le début du morceau suivant et la touche [AUTO SEARCH (⏮)] pour la reprendre à partir du morceau précédent, **enfoncer la touche [AUTO SEARCH (⏮)] deux fois.**
- Du fait que chaque fois que les touches [AUTO SEARCH (⏮)], [AUTO SEARCH (⏭)] sont enfoncées, le détecteur se déplace vers l'avant ou l'arrière par étapes d'un morceau, les enfoncer le nombre de fois voulues. En plus, appuyer sur ces touches pour retourner/continuer jusqu'au morceau désiré.

Pour répéter la lecture

- Appuyer sur la touche [REPEAT ALL/1]. Le témoin ALL REPEAT s'allume et toutes les sélections, ou toutes les sélections programmées, du disque peuvent être lues à plusieurs reprises. Si on réappuie sur la touche [REPEAT ALL/1], "REPEAT 1" apparaît sur la fenêtre d'affichage et une sélection désignée peut être lue à plusieurs reprises. Pour annuler la lecture répétée, appuyer de nouveau sur la touche [REPEAT ALL/1].

Programmed play

(Tunes are played in the sequence in which they were programmed)

1. Press the [STOP (■)/CLEAR] button to set the player to the standby mode.
2. Press the [AUTO SEARCH (▶▶|)] button until the first desired program tune is displayed, then press the [PROGRAM] button, the play time of the first tune that you have just programmed will be displayed.
3. To continue programming other tunes press the [AUTO SEARCH (|◀◀)] button until the next desired tune is displayed, then press the [PROGRAM] button.
   Follow this procedure until all your desired tunes are programmed in.
4. To play the preprogrammed tunes, press the [PLAY (▶)/PAUSE (❚❚)] button, your selection will now be played automatically according to the sequence in which they were programmed.

Notes:

- **A maximum of 32 out of 99 tunes can be selected.**
- **When the total playing time of all the selected tunes exceeds 99 minutes and 59 seconds, the time display will be disabled and only the center bars will be displayed.**
- **If the track number of a programmed tune is greater than 33, the playing time will not be displayed.**
- **The total playing time display is useful when making recordings from the CD player.**
- **Pressing the [AUTO SEARCH (▶▶|)] button when in the programmed play or pause mode caused the unit to skip to the next programmed tune.**
- **To stop temporarily during programmed play, press the [PLAY (▶)/PAUSE (❚❚)] button; press this button again to restart.**
- **When the programmed play is performed, the tune number programmed first and the total playing time of programmed tunes are displayed.**

To check or correct the programmed tunes

- **Checking the contents of the program**
  Each time the [AUTO SEARCH (▶▶|)] button is pressed in the pause mode or after starting play, the tune numbers of the programmed tunes are displayed in turn.
- **Correcting a program**

1. To erase all the programmed tunes, press the [STOP (■)/CLEAR] button to enter the stand-by mode, and then press the [STOP (■)/CLEAR] button again.
2. To change the contents of the program, erase the program in the same manner as in 1, and then restart programming from the beginning.

Programmierte Wiedergabe

(Die Titel werden in der Programmfolge abgespielt.)

1. Betätigen Sie Taste [STOP (■)/CLEAR], um den Player auf Bereitschaft zu stellen.
2. Betätigen Sie Taste [AUTO SEARCH (▶▶|)], bis der gewünschte Titel angezeigt wird, dann Taste [PROGRAM], worauf die Spielzeit des gerade einprogrammierten ersten Titels angezeigt wird.
3. Um weitere Titel ins Spielprogramm aufzunehmen, drücken Sie Taste [AUTO SEARCH (|◀◀)], bis der nächste gewünschte Titel angezeigt wird, und dann Taste [PROGRAM].
   Befolgen Sie diese Prozedur, bis alle gewünschten Titel ins Programm aufgenommen sind.
4. Um die vorprogrammierten Titel abzuspielen, drücken Sie Taste [PLAY (▶)/PAUSE (❚❚)]. Ihre Auswahl wird nun in der einprogrammierten Reihenfolge automatisch abgespielt.

Hinweise:

- **Von 99 Titeln lassen sich maximal 32 vorprogrammieren.**
- **Wenn die Gesamtspielzeit aller gewählten Titel 99 Minuten und 59 Sekunden überschreitet, wird die Zeitanzeige ausgeschaltet und stattdessen Leerstriche angezeigt.**
- **Falls die Titelnummer eines Programmtitels größer als 33 ist, wird seine Spielzeit nicht angezeigt.**
- **Die Anzeige der Gesamtspielzeit ist besonders nützlich, wenn Sie vom CD-Player aufnehmen.**
- **Wenn Sie während der Programmwiedergabe oder bei Pausebetrieb Taste [AUTO SEARCH (▶▶|)] betätigen, springt der Abnehmer zum nächsten programmierten Titel vor.**
- **Soll die programmierte Wiedergabe unterbrochen werden, die [PLAY (▶)/PAUSE (❚❚)]-Taste betätigen; zum erneuten Start diese Taste nochmals betätigen.**
- **Bei programmierter Wiedergabe ersheint die erste programmierte Titelnummer und die Gesamtspielzeit aller programmierten Titel im Display.**

Überprüfung und Korrektur der Programmierung

- **Überprüfung des Programminhalts**
  Bei Pausebetrieb oder nach Wiedergabestart bewirkt jedes Betätigen der [AUTO SEARCH (▶▶|)]-Taste die Anzeige der programmierten Titel im Display.
- **Korrektur eines Programms**

1. Um alle programmierten Titel zu löschen, schalten Sie mittels Taste [STOP (■)/CLEAR] auf Bereitschaftsbetrieb und betätigen dann wieder Taste [STOP (■)/CLEAR].
2. Um den Inhalt eines Programm zu ändern, löschen Sie es wie in 1 oben und beginnen dann von neuem mit dem Einprogrammieren.

Lecture programmée

(les morceaux sont lus dans la séquence selon laquelle ils ont été programmés.)

1. Enfoncer la touche [STOP (■)/CLEAR] pour mettre le lecteur en mode d'attente.
2. Enfoncer la touche [AUTO SEARCH (▶▶|)] jusqu'à ce que le premier morceau programmé voulu soit affiché. Puis, appuyer sur la touche [PROGRAM], et la durée de lecture du premier morceau qui vient d'être programmé est affiché.
3. Pour continuer la programmation des autres morceaux, appuyer sur la touche [AUTO SEARCH (|◀◀)] jusqu'à ce que le morceau suivant voulu soit affiché. Puis appuyer sur la touche [PROGRAM].
   Poursuivre ce procédé jusqu'à ce que tous les morceaux voulus soient programmés.
4. Pour commencer la lecture de morceaux, appuyer sur la touche [PLAY (▶)/PAUSE (❚❚)], les morceaux sélectionnés sont alors automatiquement lus dans la séquence selon laquelle ils été programmés.

Remarques:

- **Un maximum de 32 programmes peut être sélectionné à partir de 99 morceaux.**
- **Quand la durée totale de la lecture des morceaux programmés est supérieure à 99 minutes 59 secondes, elle n'est pas affichée et seules les barres centrales sont indiquées à l'affichage.**
- **Quand le nombre de morceaux dépasse le 33ème, la durée de lecture n'est pas affichée.**
- **L'affichage de la durée totale de lecture est très pratique lors de l'enregistrement depuis le lecteur de disques audionumériques.**
- **Pendant la lecture programmé ou dans le mode de pause, une pression sur la touche [AUTO SEARCH (▶▶|)] fait passer au morceau suivant dans l'ordre programmé.**
- **Pour arrêter momentanément pendant la lecture programmée, enfoncer la touche [PLAY (▶)/PAUSE (❚❚)]; la réenfoncer pour reprendre la lecture.**
- **Quand la lecture programmée est effectuée, le numéro du morceau programmé en premier et la durée de lecture totale des morceaux programmés sont affichés.**

Pour vérifier ou modifier la programmation

- **Vérification du contenu de la programmation**
  A chaque pression sur la touche [AUTO SEARCH (▶▶|)] dans le mode de pause ou après que la lecture est commencée, les numéros des morceaux de la programmation sont affichés tour à tour.
- **Correction d'une programmation**

1. Pour effacer toute la musique programmée, enfoncer la touche [STOP (■)/CLEAR] pour mettre le disque en position d'attente et ensuite enfoncer la touche [STOP (■)/CLEAR] de nouveau.
2. Pour corriger le contenu d'une programmation, effacer la programmation de la même manière qu'au numéro 1. et recommencer la programmation dès le début.

Editing/Recording

- **Manual Editing and Recording**

1. Put power on to set to standby status.
2. Press the [EDITING] button.
3. Designate the time framework by pressing the [SEARCH (◀◀, ▶▶)] button.
4. Designate the tune you wish to program with the [AUTO SEARCH (|◀◀, ▶▶|)] button.
5. Press the [PROGRAM] button.
   When the tune is programmed, the time for the programmed tune is subtracted from the designated time framework and the "REMAIN TIME" is displayed.
6. By repeating steps 4 and 5, programming is done until the "REMAIN TIME" becomes zero.
   When the tune being programmed goes over the designated time framework, the TRACK NO blinks to indicate this.
   When programming is done in excess of the designated time framework, the excess time is indicated by a minus display and the EDITING display blinks, in this case, press the [CANCEL] button and cancel the last programmed tune.
7. Set the cassette deck to the REC PAUSE mode.
8. When the [PLAY (▶)] button is pressed, recording is started and will automatically stop when the last programmed tune ends.
9. In order to cancel playing of the EDITING mode, press the [STOP (■)/CLEAR] button twice which will result in a return to the standby status.
   The operations in steps 7 and 8 above are limited to a combination using this company's COMPU LINK system.
   For other cassette decks, press the [PLAY (▶)] button after setting the cassette deck in recording status.

Note:

- **EDITING can be done for up to 31 tunes.**

- **Auto Editing and Recording**

1. Set to standby status.
2. Designate the start tune with the [AUTO SEARCH (|◀◀, ▶▶|)] button.
3. Designate the time framework with the [SEARCH (◀◀, ▶▶)] button.
4. Press the [EDITING] button.
   The [EDITING] button lights and the last tune that can be programmed within the time framework and the REMAIN TIME will be displayed. At this time, the question of whether or not there is a tune that can be programmed within the remaining time can be confirmed and a program addition can be done similar to MANUAL EDITING by designating a tune.
   The rest of the steps are the same as steps 7 to 9 of MANUAL EDITING.

Programmzeitkontrolle/Aufnahme

- **Manuelle Programmzeitkontrolle und Aufnahme**

1. Schalten Sie die Netzspannung ein, um auf Bereitschaft zu gehen.
2. Drücken Sie auf Taste [EDITING].
3. Legen Sie den Zeitrahmen durch Betätigen von Taste [SEARCH (◀◀, ▶▶)] fest.
4. Suchen Sie den ins Program aufzunehmenden Titel mittels Taste [AUTO SEARCH (|◀◀, ▶▶|)].
5. Drücken Sie auf Taste [PROGRAM].
   Wenn der Titel ins Spielprogramm aufgenommen ist, wird seine Spielzeit von der vorher festgelegten Rahmenzeit abgezogen und die verbleibende Zeit bei "REMAIN TIME" angezeigt.
6. Durch Wiederholen von Schritt 4 und 5 läßt sich so lange programmieren, bis "REMAIN TIME" null ist.
   Wenn der gerade ins Programm aufzunehmende Titel über den Zeitrahmen hinausgeht, wird darauf durch Blinken der Anzeige TRACK NO hingewiesen.
   Wenn das Spielprogramm den Zeitrahmen überschreitet, wird der entstandene Zeitmangel durch eine Minusanzeige und blinkende EDITING-Anzeige dargestellt. Drücken Sie in solchem Fall Taste [CANCEL], um den letzten Programmtitel zu löschen.
7. Schalten Sie das Cassettendeck auf Betrieb REC PAUSE.
8. Wenn Sie Taste [PLAY (▶)] betätigen, beginnt die Aufnahme, die dann am Ende des letzten Programmtitels automatisch abbricht.
9. Um Betrieb EDITING abzubrechen, drücken Sie zweimal auf Taste [STOP (■)/CLEAR]; das Gerät schaltet dann auf Bereitschaft zurück.
   Die in 7 und 8 oben beschriebenen Funktionen sind nur für eine Kombination mit dem JVC-System COMPU LINK gültig.
   Bei anderen Cassettendecks schalten Sie das Kassettengerät auf Aufnahme und drücken dann Taste [PLAY (▶)] des CD-Players.

Hinweis:

- **EDITING ist für maximal 31 Titel vorzunehmen.**

- **Automatische Programmzeitkontrolle und Aufnahme**

1. Schalten Sie auf Bereitschaftsbetrieb.
2. Legen Sie den Anfangstitel mittels Taste [AUTO SEARCH (|◀◀, ▶▶|)] fest.
3. Legen Sie den Zeitrahmen durch Betätigen von Taste [SEARCH (◀◀, ▶▶)] fest.
4. Betätigen Sie Taste [EDITING].
   Taste [EDITING] leuchtet auf, und der letzte innerhalb des Zeitrahmens programmierbare Titel sowie die verbleibende Zeit REMAIN TIME wird angezeigt. Nun läßt sich feststellen, ob innerhalb der Restzeit noch ein weiterer Titel aufnehmbar ist. Ein zusätzlicher Titel wird dann ähnlich wie in MANUELLE PROGRAMMZEITKONTROLLE ins Programm aufgenommen. Die restlichen Schritte sind gleich wie Schritte 7 bis 9 von MANUAL EIDTING.

Edition/enregistrement

- **Edition et enregistrement manuels**

1. Mettre l'appareil sous tension pour le mettre dans le mode d'attente.
2. Appuyer sur la touche [EDITING].
3. Indiquer la durée totale en appuyant sur la touche [SEARCH (◀◀, ▶▶)].
4. Indiquer le morceau que vous voulez programmer en appuyant sur la touche [AUTO SEARCH (|◀◀, ▶▶|)].
5. Appuyer sur la touche [PROGRAM].
   Lorsque le morceau est programmé, la durée pour le morceau programmé est soustraite de la durée totale indiquée et la durée restante (REMAIN TIME) est affichée.
6. En recommençant les opérations 4 et 5, la programmation s'effectue jusqu'à ce que la durée restante (REMAINING TIME) devienne zéro.
   Lorsque le morceau en cours de la programmation dépasse la durée totale indiquée, le N^{O} de piste (TRACK NO) clignote pour indiquer cet état.
   Lorsque la programmation est effectuée au-delà de la durée totale indiquée, la durée excédentaire est indiquée par un affichage négatif et l'affichage d'édition (EDITING) clignote. En ce cas, appuyer sur la touche d'annulation [(CANCEL)] et annuler le dernier morceau programmé.
7. Mettre la platine à cassettes dans le mode REC POSE.
8. Lorsque la touche de lecture [PLAY (▶)] est enfoncée, l'enregistrement commence et automatiquement s'arrête quand le dernier morceau programmé se termine.
9. Pour annuler la lecture en mode d'édition (EDITING), appuyer deux fois sur la touche [STOP (■)/CLEAR], ce qui permet le retour au mode d'attente.
   Les opérations 7 et 8 mentionnées ci-dessus sont limitées à un appareil muni de notre système COMPU LINK.
   Pour les autres appareils, appuyer sur la touche de lecture [PLAY (▶)] après avoir mis la platine à cassettes dans le mode d'enregistrement.

Remarque:

- **L'édition (EDITING) peut être effectuée jusqu'aux 31 morceaux.**

- **Edition et enregistrement automatiques**

1. Mettre l'appareil dans le mode d'attente.
2. Indiquer le morceau initial en appuyant sur la touche [AUTO SEARCH (|◀◀)].
3. Indiquer la durée totale en appuyant sur la touche [SEARCH (◀◀, ▶▶)].
4. Appuyer sur la touche d'édition [EDITING].
   L'indicateur d'édition [EDITING] s'allume et le dernier morceau pouvant être programmé dans la durée totale et la durée restante (REMAIN TIME) est affiché. A ce moment-là, le problème pour savoir s'il reste encore un morceau pouvant être programmé dans la durée restante peut être vérifié, et l'addition de programme peut être effectuée de la même façon que celle pour l'édition manuelle (MANUAL EDITING) en indiquant un morceau.
   Le reste des opérations est identique à celui des opérations de 7 à 9 pour l'édition manuelle (MANUAL EDITING).

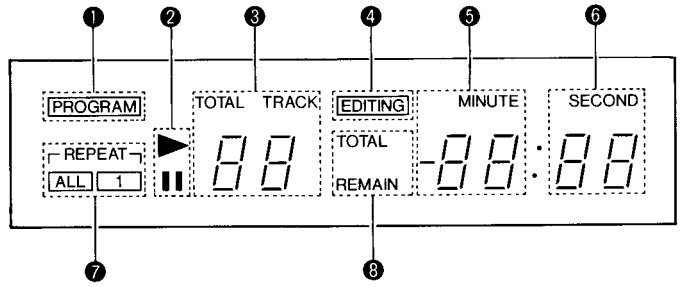


Fig. 8
Abb. 8
Afb. 8

DISPLAY

❶ This mark lights during programming.
❷ This mark lights during play
❷ This mark lights in the pause mode.
❸ TOTAL lights when a disc has been loaded. The total number of tunes is displayed for about 3 seconds when a disc has been loaded and set for play. The track number of the current tune is displayed while a disc is being played.
❹ This mark lights during edited recording.
❺ The elapsed playing time appears in minutes.
❻ The elapsed playing time appears in seconds.
❼ This mark lights when the REPEAT ALL/1 button is pressed.
ALL: Lights when the repeat play of all the selections are instructed.
1: Lights when the repeat play of only one selection is instructed.
❽ **TOTAL:** Lights during loading and editing.
REMAIN: Lights during editing.

DISPLAY

❶ Leuchtet während des Programmierens auf.
❷ Leuchtet während der Wiedergabe auf.
❷ Leuchtet während Pausebetrieb auf.
❸ TOTAL leuchtet auf, wenn eine Disc eingelegt ist.
Die Gesamtzahl von Titeln wird etwa 3 Sekunden lang angezeigt, wenn eine Disc eingelegt und spielbereit ist. Die Titelnummer des laufenden Titels wird angezeigt, solange die Disc abgespielt wird.
❹ Leuchtet während Aufnahmen mit Programmzeitkontrolle auf.
❺ Die verstrichene Spielzeit wird in Minuten angezeigt.
❻ Die verstrichene Spielzeit wird in Sekunden angezeigt.
❼ Leuchtet auf, wenn REPEAT ALL/1 gedrückt ist.
ALL: Leuchtet auf, wenn die Wiederholung von allen Titeln angewiesen ist.
1: Leuchtet auf, wenn die Wiederholung von nur einem Titel angewiesen ist.
❽ **TOTAL:** Leuchtet während Einlagerung und Aufnahme auf.
REMAIN: Leuchtet während Aufnahme auf.

AFFICHAGE

❶ Ce repère s'allume pendant la programmation.
❷ Ce repère s'allume pendant la lecture.
❷ Ce repère s'allume dans le mode de pause.
❸ TOTAL s'allume lorsqu'un disque vient d'être placé.
Le nombre total de morceaux est affiché pendant 3 secondes environ lorsqu'un disque vient d'être placé et qu'il est prêt pour la lecture. Le numéro du morceau en cours est affiché lorsque le disc est en cours de lecture.
❹ Ce repère s'allume pendant l'enregistrement édité.
❺ Le temps de lecture écoulé apparaît en minutes.
❻ Le temps de lecture écoulé apparaît en secondes.
❼ Ce repère s'allume lorsque la touche REPEAT ALL/1 est enfoncée.
ALL: S'allume lorsque la lecture répétée de toutes les sélections est indiquée.
1: S'allume lorsque la lecture répétée d'une seule sélection est indiquée.
❽ **TOTAL:** S'allume pendant le chargement et l'édition.
REMAIN: S'allume pendant l'édition.

TROUBLESHOOTING

What appears to be a malfunction may not always be serious.
Check first . . .
The POWER is not applied even when the POWER button is pressed.
Is there power at the wall outlet?
– Connect the power plug firmly and correctly.
The search does not start when the disc platter is retracted.
Is the disc upside down?
– Load the disc with the label facing up.
Is the disc dirty?
– Clean the surface of the disc.
Refer to "Maintenance of discs" on page 7.
Are there scratches on the surface of the disc?
– Change the disc.
Are the holder and the screws for transportation removed?
– Remove them referring to BEFORE USE on page 7.

STÖRUNGSSUCHE

Nicht jede Störung ist auf einen Schaden zurückzuführen.
Zuerst überprüfen . . .
Die POWER-Anzeige leuchtet nicht, obwohl die POWER-Taste gedrückt wurde.
Ist das Netzkabel ordnungsgemäß angeschlossen?
– Das Netzkabel fest und richtig anschließen.
Der Suchlauf beginnt nicht, obwohl der Disc-Halter eingefahren ist.
Liegt die Compact-Disc verkehrt herum Halter?
– Die Compact-Disc mit der Etikettenseite nach oben einlegen.
Ist die Compact-Disc verschmutzt?
– Die Oberfläche reinigen.
Siehe "Pflege von Compact-Discs" auf Seite 7.
Ist die Oberfläche der Compact-Disc verkratzt?
– Eine andere Disc einlegen.
Sind Halter und Transportschrauben abgenommen?
– Entfernen Sie sie gemäß den Anweisungen unter VOR DEM BETRIEB auf Seite 7.

EN CAS DE DIFFICULTE

Ce qui semble au départ être un mauvais fonctionnement n'est pas toujours très sérieux.
Assurez-vous d'abord que . . .
L'alimentation n'est pas fournie même quand la touche POWER est enfoncée.
La prise est-elle correctement branchée?
– La brancher fermement et correctement.
La recherche ne commence pas même si le plateau est rétracté.
Le disque est-il sens dessus dessous?
– Le mettre en place avec son label dirigé vers le haut.
Le disque est-il sale?
– Nettoyer sa surface.
Se référer à "Entretien des disques", page 7.
Y a-t-il des rayures sur la surface du disque?
– Changer le disque.
Est-ce que les supports et vis de transport sont retirés?
– Les retirer en se reportant à "AVANT UTILISATION", page 7.

SPECIFICATIONS

System	: Compact disc player
Signal detection system	: Non-contact optical system pickup
Number of channels	: 2 channels
Frequency response	: 5 Hz – 20,000 Hz
Dynamic range	: 95 dB (1 kHz)
Signal/noise ratio	: 98 dB
Channel separation	: 90 dB (1 kHz)
Total harmonic distortion	: 0.004%
Wow and flutter	: Less than measurable limit
Output level	: 2.0 Vrms (full scale)
Number of program steps	: 32 steps
Power source	: Refer to the table on back page.
Power consumption	: Refer to the table on back page.
Dimensions	: 435 (W) x 87 (H) x 291 (D) mm (17-2/16" x 3-7/16" 11-7/16")
Weight	: 4.0 kg (8.8 lbs)
Accessories	: Audio cable . . . . . 1 Remote cable (1 m) 1

Design and specifications subject to change without notice.

TECHNISCHE DATEN

System	: Compact-Disc-Player
Signal-Abtastsystem	: Kontaktloser optischer Abnehmer
Anzahl der Kanäle	: 2
Frequenzbereich	: 5 Hz – 20.000 Hz
Dynamikbereich	: 95 dB (1 kHz)
Signalrauschabstand	: 98 dB
Kanaltrennung	: 90 dB (1 kHz)
Klirrfaktor	: 0.004%
Gleichlaufschwan kungen	: Unterhalb der Meßgrenze
Ausgangsleistung	: 2,0 V (Maximal-Einstellung)
Programmschritte	: 32
Spannungsversogung	: Siehe Tabelle auf der letzten Seite
Abmessungen	: 435 (B) x 87 (H) x 291 (T) mm
Gewicht	: 4,0 kg
Zubehör	: Audio-Kabel . . . . 1 Fernbedienkabel (1 m) 1

Technische Änderungen vorbehalten.

CARACTERISTIQUES TECHNIQUES

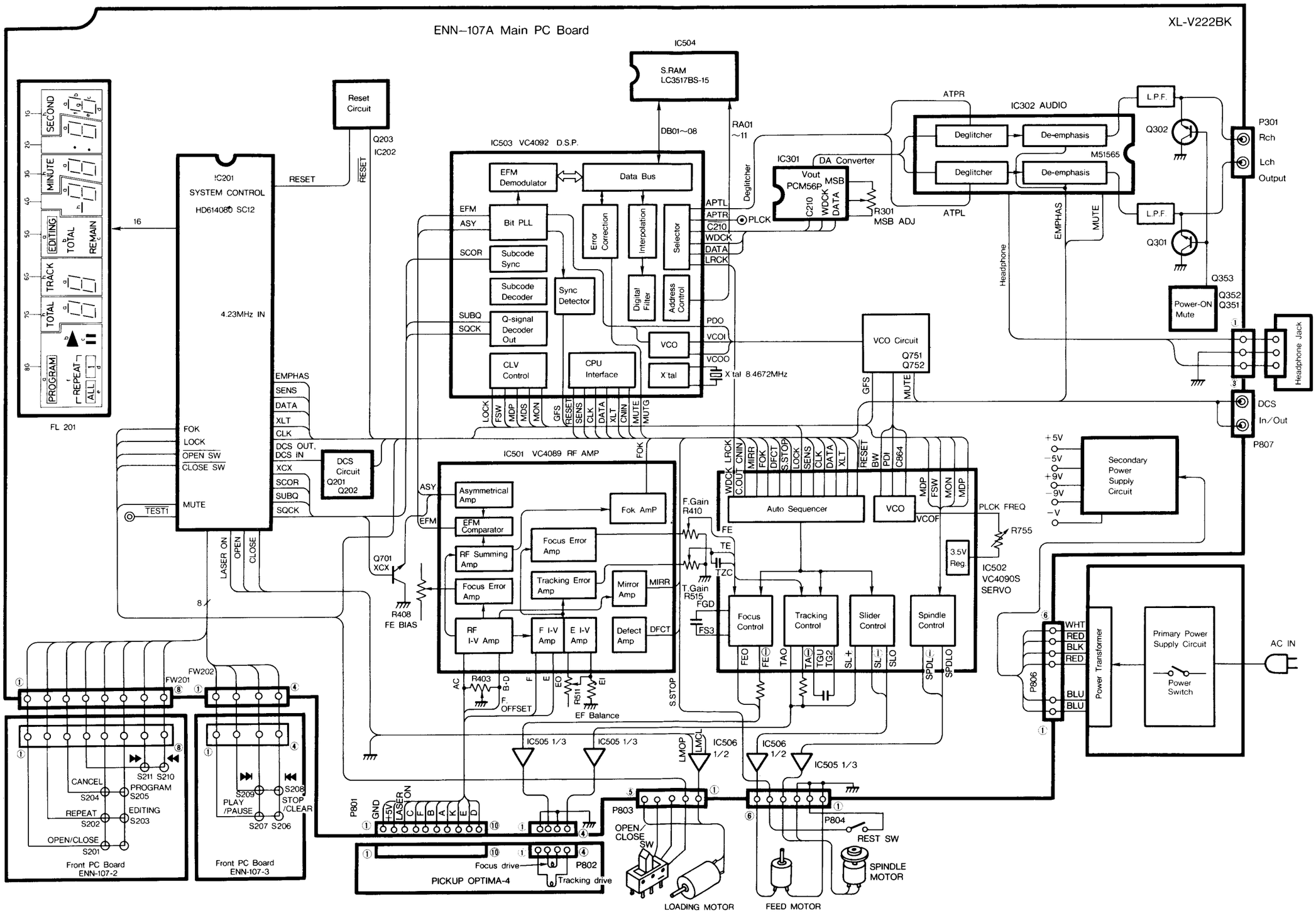
Système	: Lecteur de disque audionumérique
Système de détection du signal	: Captage optique sans contact
Nombre de canaux	: 2 canaux
Réponse en fréquence	: 5 Hz – 20.000 Hz
Gamme dynamique	: 95 dB (1 kHz)
Rapport signal/bruit	: 98 dB
Séparation des canaux	: 90 dB (1 kHz)
Distorsion harmonique totale	: 0,004%
Pleurage et scintillement	: Inférieur à la limite mesurable
Niveau de sortie	: 2,0 Vrms (échelle complète)
Nombre d'étapes de programme	: 32 étapes
Alimentation	: Se référer au tableau de la page arrière
Consommation	: Se référer au tableau de la page arrière
Dimensions	: 435 (L) x 87 (H) x 291 (P) mm
Poids	: 4,0 kg
Accessoires	: Câble d'audio . . . . 1 Câble de télécommande (1 m) 1

Présentation et caractéristiques modifiables sans préavis.

POWER SPECIFICATIONS

Areas	Line Voltage & Frequency	Power Consumption
U.S.A.	AC 120 V ∿, 60 Hz	10 watts
Canada		
Continental Europe	AC 220 V ∿, 50 Hz	
U.K.	AC 240 V ∿, 50 Hz	
Australia		
U.S. Military Market	AC 110 / 120 / 220 / 240 V ∿ selectable, 50/60 Hz	
Other areas		

Block Diagram



Description of Major LSI ICs

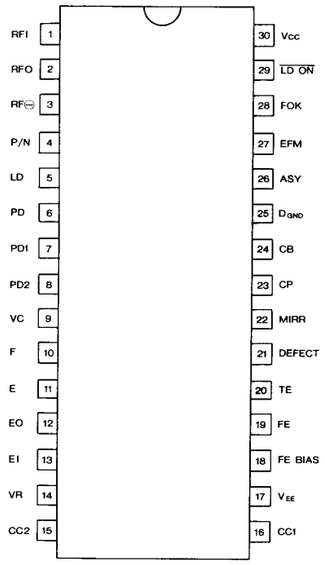
■ VC4089S (IC501)

(1) Outline:

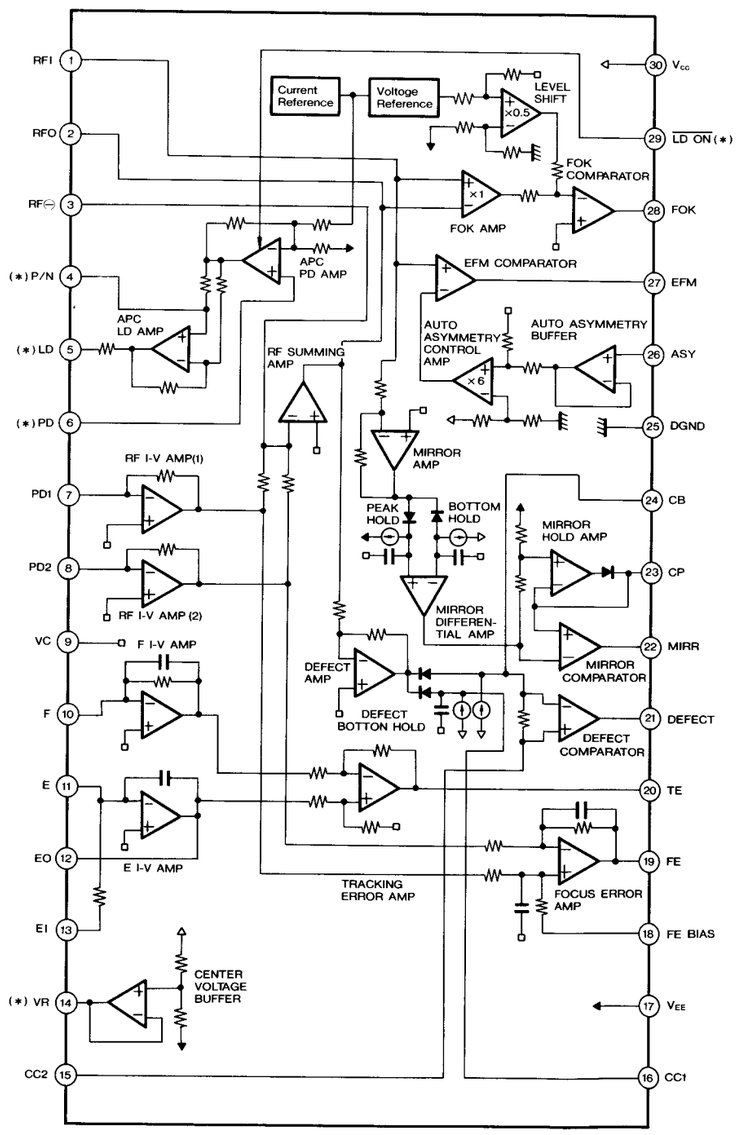
The VC4089S is a signal processing LSI for use with a 3-spot optical pickup output in a CD player, and has the following functions.

- EFM comparator
- Defect detection circuit
- Auto asymmetry control amp.

(2) Appearance



(3) Block Diagram



(*): Not used in this unit

(4) Pin Functions

Pin No.	Pin Name	I/O	Outline of Functions
1	RFI	I	Input pin to which the output of RF summing amp is input after capacitive coupling.
2	RFO	O	Output pin of RF summing amp
3	RF –	I	Feedback input pin of RF summing amp
4	P/N	I	Not used in this unit
5	LD	O	
6	PD	I	
7	PD1	I	Inverted input pin of RF I-V amp (1). Connected to A+C pin of photodiode, it accepts current input.
8	PD2	I	Inverted input pin of RF I-V amp (2). Connected to B+D pin of photodiode, it accepts current input.
9	VC	–	With +/– (dual) power supply: Used as GND. With single power supply: VR (Connected to pin 14)
10	F	I	Inverted input pin of F I-V amp. Connected to F pin of photodiode, it accepts current input.
11	E	I	Inverted input pin of E I-V amp. Connected to E pin of photodiode, it accepts current input.
12	EO	O	Output pin of E I-V amp.
13	EI	I	Feedback input pin of E I-V amp. Used for gain adjustment of E I-V amp.
14	VR	O	Not used in this unit.
15	CC2	I	Input pin to which DEFECT bottom hold output is input after capacitive coupling.
16	CC1	O	DEFECT bottom hold output pin.
17	VEE	–	With +/– (dual) power supply: Negative power supply pin. With single power supply: GND pin
18	FE BIAS	I	Bias pin of the non-inverted side of focus error amp. Used for CMR adjustment of the focus error amp.
19	FE	O	Focus error amp output pin.
20	TE	O	Tracking error amp output pin.
21	DIFECT	O	DEFECT comparator output pin.
22	MIRR	O	MIRR comparator output pin. (DC voltage: 10 kohm load connected)
23	CP	I	MIRR hold capacitor connection pin. MIRR comparator non-inverted input pin.
24	CB	I	DEFECT bottom hold capacitor connection pin.
25	DGND	–	With +/– (dual) power supply: GND With single power supply: GND
26	ASY	I	Auto asymmetry control input pin.
27	EFM	O	EFM comparator output pin.
28	FOK	O	Focus OK comparator output pin. (DC voltage: 10 kohm load connected)
29	LD ON	I	Not used in this unit.
30	Vcc	–	Positive power supply pin.

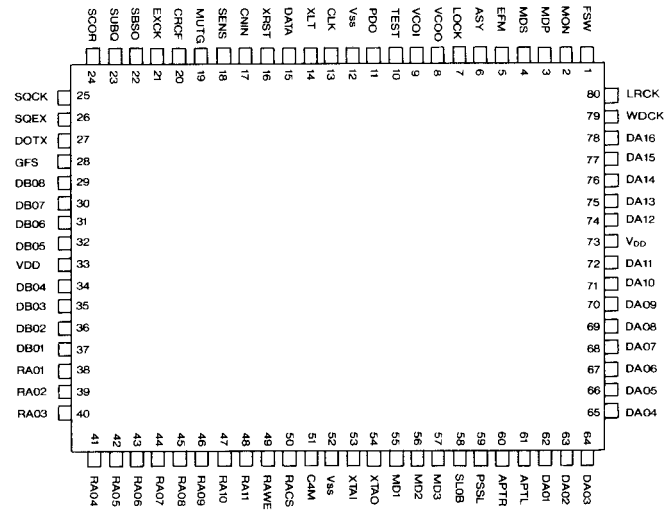
■ VC4092 (IC503)

(1) Outline:

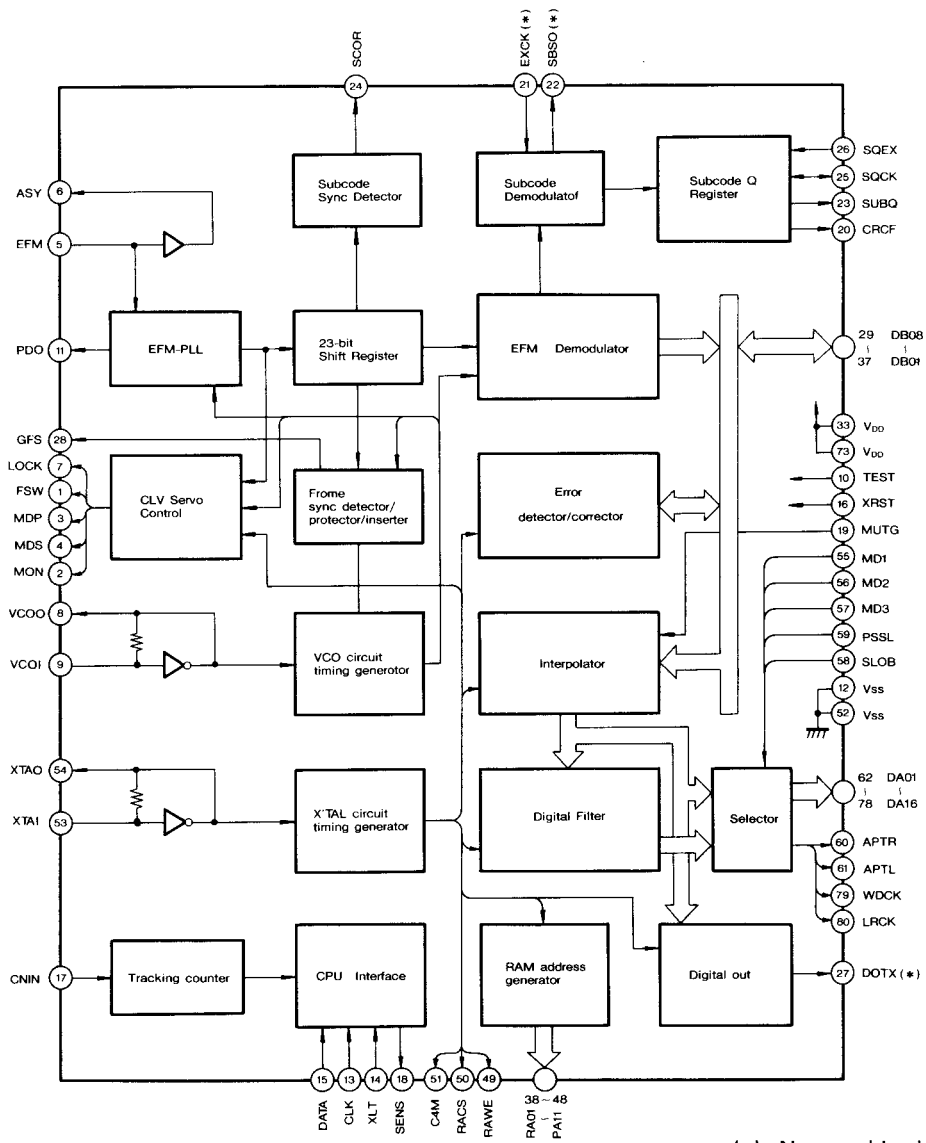
The VC4092 is a digital signal processing LSI to be used in CD players, and has the following functions.

- Bit clock reproduction by EFM-PLL circuit
- EFM data decoding
- Detection, protection and internal insertion of frame sync signal
- Powerful error detection and correction
- Interpolation with average value, or holds previous value
- CLV servo of the spindle motor
- 8-bit tracking counter
- CPU interface with serial bus
- Register for subcode Q
- Digital filter

(2) Appearance



(3) Block Diagram



(*) Not used in this unit

(4) Pin Function

Pin No.	Pin Name	I/O	Outline of Functions
1	FSW	O	Time constant selection output of output filter for spindle motor.
2	MON	O	ON/OFF control output of spindle motor.
3	MDP	O	Spindle motor drive output. Coarse control in CLV-S mode and phase control in CLV-P mode.
4	MDS	O	Spindle motor drive output. Speed control in CLV-P mode.
5	EFM	I	EFM signal input from RF amp.
6	ASY	O	Output to control the slice level of EFM signal.
7	LOCK	O	Samples GFS signal in WFCK/16 and outputs high level when it is high. If low level signal is output for 8 times successively, it outputs a low level signal.
8	VCOO	O	VCO output. When locked to EFM signal, f=8.6436 MHz.
9	VCOI	I	VCO input.
10	TEST	I	(0 V)
11	PDO	O	Output of phase comparator comparing EFM signal and VCO/2.
12	V_{SS}	–	GND (0 V)
13	CLK	I	Serial data transfer clock input from CPU. Latches the data at the rising edge of clock.
14	XLT	I	Latch input from CPU. Latches 8-bit shift register data (serial data from CPU) for each register.
15	DATA	I	Serial data input from CPU.
16	XRST	I	System reset input. Reset at low level.
17	CNIN	I	Tracking pulse input.
18	SENS	O	Outputs the internal state corresponding to each address.
19	MUTG	I	Muting input. When ATTM of internal register A is low, MUTG is low and the normal status is obtained. When it is high, muted status is engaged.
20	CRCF	O	Outputs the results from CRC check of subcode Q. (Not used in this unit)
21	EXCK	I	Clock input for serial output of subcode. (Not used in this unit.)
22	SBSO	O	Serial output of subcode.
23	SUBQ	O	Subcode Q output.
24	SCOR	O	Subcode sync S0+S1 output.
25	SQCK	I/O	Read-out clock of subcode Q.
26	SQEX	I	SQCK select input.
27	DOTX	O	Digital Out output. (Not used in this unit)
28	GFS	O	Frame sync locked state display output.
29	DB08	I/O	External RAM data pin. DATA8 (MSB)
30	DB07	I/O	External RAM data pin. DATA7
31	DB06	I/O	External RAM data pin. DATA6
32	DB05	I/O	External RAM data pin. DATA5
33	V_{DD}	–	Power supply (+5 V)
34	DB04	I/O	External RAM data pin. DATA4
35	DB03	I/O	External RAM data pin. DATA3
36	DB02	I/O	External RAM data pin. DATA2
37	DB01	I/O	External RAM data pin. DATA1 (LSB)
38	RA01	I/O	External RAM address output. ADDR01 (LSB)
39	RA02	I/O	External RAM address output. ADDR02
40	RA03	O	External RAM address output. ADDR03
41	RA04	O	External RAM address output. ADDR04
42	RA05	O	External RAM address output. ADDR05
43	RA06	O	External RAM address output. ADDR06
44	RA07	O	External RAM address output. ADDR07
45	RA08	O	External RAM address output. ADDR08

Pin No.	Pin Name	I/O	Outline of Functions
46	RA09	O	External RAM address output. ADDR09
47	RA10	O	External RAM address output. ADDR10
48	RA11	O	External RAM address output. ADDR11 (MSB)
49	RAWE	O	Write enable signal output to external RAM. (Active low)
50	RACS	O	Chip select signal output to external RAM. (Active low)
51	C4M	O	Divided output of X'tal oscillator. f=4.2336 MHz
52	V_{SS}	–	GND (0 V)
53	XTAI	I	X'tal oscillator input. f=8.4672 MHz or 16.9344 MHz depending on the mode selected.
54	XTAO	O	X'tal oscillator output. f=8.4672 MHz or 16.9344 MHz depending on the mode selected.
55	MD1	I	Mode select input 1
56	MD2	I	Mode select input 2
57	MD3	I	Mode select input 3
58	SLOB	I	Code select input of the audio data. 2's complement output at low level, and offset binary output at high level.
59	PSSL	I	Mode select input of the audio data. Serial output at low level, parallel output at high level.
60	APTR	O	Control output for aperture compensation. High for R-ch.
61	APTL	O	Control output for aperture compensation. High for R-ch.
62	DA01	O	Outputs DA01 (LSB of parallel audio data) when PSSL is high. Outputs C1F1 when PSSL is low.
63	DA02	O	Outputs DA02 when PSSL is high. Outputs C1F2 when PSSL is low. (Not used in this unit.)
64	DA03	O	Outputs DA03 when PSSL is high. Outputs C2F1 when PSSL is low. (Not used in this unit.)
65	DA04	O	Outputs DA04 when PSSL is high. Outputs C2F2 when PSSL is low. (Not used in this unit.)
66	DA05	O	Outputs DA05 when PSSL is high. Outputs C2FL when PSSL is low. (Not used in this unit.)
67	DA06	O	Outputs DA06 when PSSL is high. Outputs C2PO when PSSL is low.
68	DA07	O	Outputs DA07 when PSSL is high. Outputs RFCK when PSSL is low. (Not used in this unit.)
69	DA08	O	Outputs DA08 when PSSL is high. Outputs WFCK when PSSL is low. (Not used in this unit.)
70	DA09	O	Outputs DA09 when PSSL is high. Outputs PLCK when PSSL is low. (Not used in this unit.)
71	DA10	O	Outputs DA10 when PSSL is high. Outputs UGFS when PSSL is low. (Not used in this unit.)
72	DA11	O	Outputs DA11 when PSSL is high. Outputs GTOP when PSSL is low. (Not used in this unit.)
73	V_{DD}	–	Power supply (+5 V).
74	DA12	O	Outputs DA12 when PSSL is high. Outputs RAOV when PSSL is low. (Not used in this unit.)
74	DA13	O	Outputs DA13 when PSSL is high. Outputs C4LR when PSSL is low. (Not used in this unit.)
76	DA14	O	Outputs DA14 when PSSL is high. Outputs C21O when PSSL is low.
77	DA15	O	Outputs DA15 when PSSL is high. Outputs C21O when PSSL is low. (Not used in this unit.)
78	DA16	O	Outputs DA16 (MSB of audio data) when PSSL is high. Outputs DATA when PSSL is low.
79	WDCK	O	Strobe signal output. 176.4 kHz when DF is ON, 88.2 kHz when DF is OFF.
80	LRCK	O	Strobe signal output. 88.2 kHz when DF is ON, 44.1 kHz when DF is OFF.

Notes:

C1F1/
C1F2: Error correction state monitor output after decoding C1.
C2F1/
C2F2: Error correction state monitor output after decoding C2.
C2FL: Error correction state output. Goes high when the C2 data stream currently being corrected cannot be corrected.
C2PO: C2 pointer display output. Synchronized with the audio data output.
RFCK: Read frame clock output. 7.35 kHz from X'tal oscillator.
WFCK: Write frame clock output. 7.35 kHz when locked to X'tal oscillator signal.
PLCK: VCO/2 output. f=4.3218 MHz when locked to EFM signal.
UGFS: Unprotected frame sync pattern output.
GTOP: Frame sync protected state display output.
RAOV: Overflow or underflow display output of the RAM for jitter absorption of +/– 4 frames.
C4LR: Strobe signal. 352.8 kHz when DF is ON, 176.4 kHz when DF is OFF.
C21O: Inverted output of C21O.
C21O: Bit clock output. 4.2336 MHz when DF is ON, 2.1168 MHz when DF is OFF.
DATA: Serial data output of audio signal.

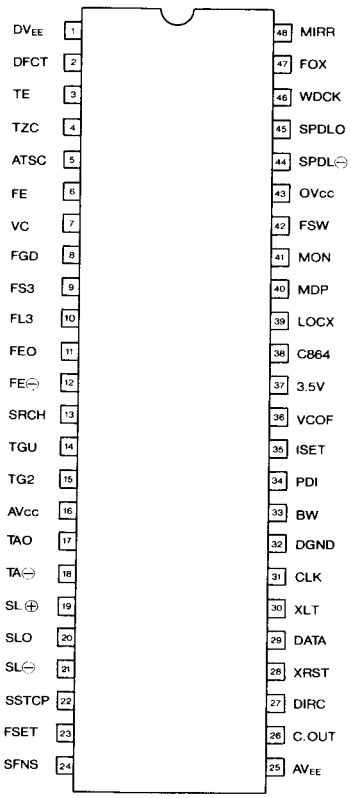
■ VC4090S (IC502)

(1) Outline:

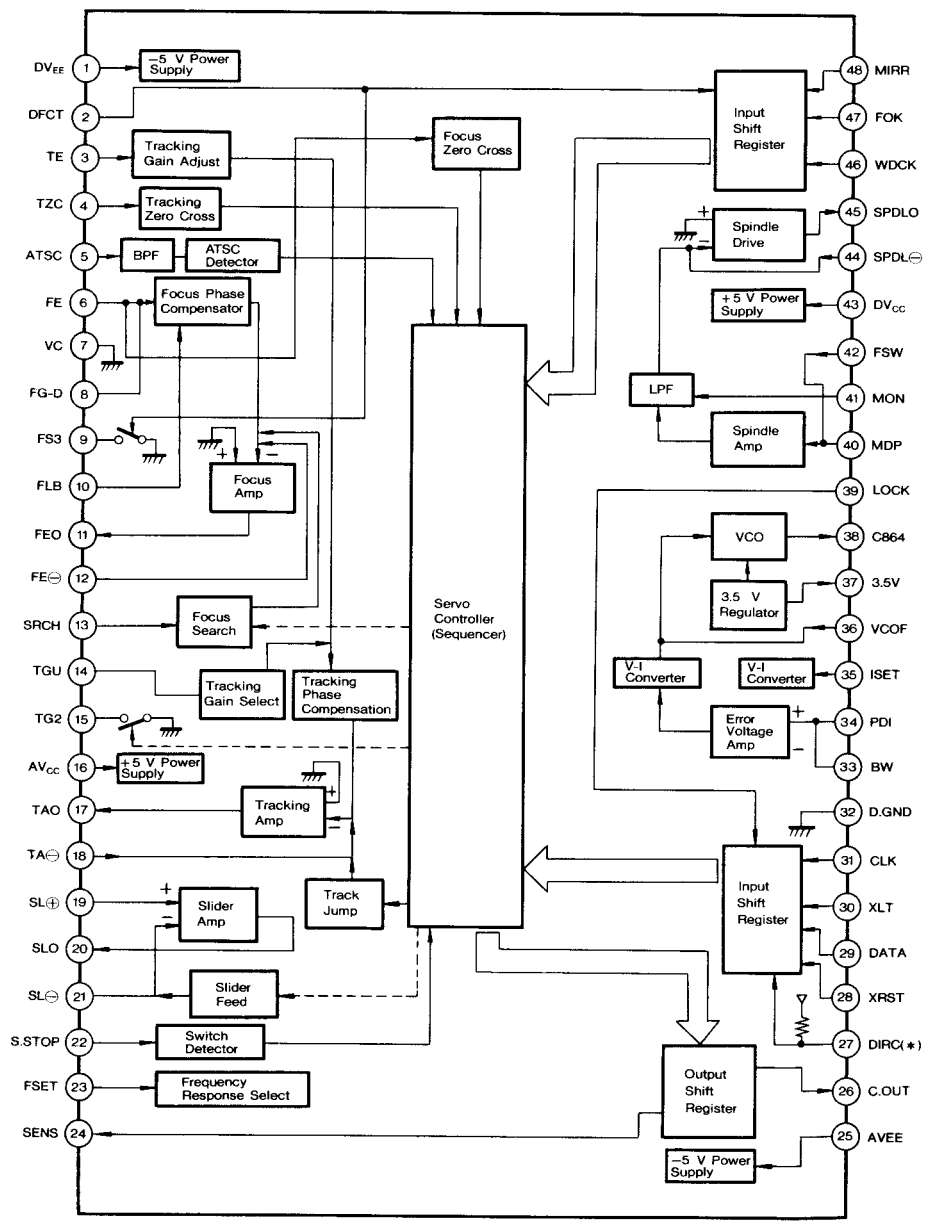
The VC4090S is a Bipolar IC for servo control of a CD player, and has the following functions.

- Focus servo control
- Tracking servo control
- Feed servo control
- Spindle servo control (LPF, Drive amp)
- EFM clock reproduction PLL (Loop filter, 8.64 MHz VCO)
- Automatic sequencer (incorporating RAM)

(2) Appearance



(3) Block Diagram



(*): Not used in this unit.

(4) Pin Functions

Pin No.	Pin Name	I/O	Outline of Functions
1	DV_{EE}	–	Power supply (–5 V).
2	DFCT	I	Defect signal input pin. Defect ON at high level.
3	TE	I	Tracking error signal input pin.
4	TZC	I	Tracking zero-cross input pin.
5	ATSC	I	Window comparator input pin for ATSC detection.
6	FE	I	Focus error signal input pin.
7	VC	–	GND.
8	FGD	–	Focus gain down. Short-circuit between ⑧ and ⑨ with capacitor to decrease high-frequency gain.
9	FS3	–	Same as above.
10	FLB	I	For connection of external time constant components for boosting the low frequency of focus servo.
11	FEO	O	Focus drive output.
12	FE ⊖	I	Inverted input pin of focus amp.
13	SRCH	I	For connection of external time constant components for generating focus search waveform.
14	TGU	I	For connection of external time constant components for high-frequency tracking gain selection.
15	TG2	I	For connection of external time constant components for high-frequency tracking gain selection.
16	AV_{CC}	–	Power supply (+5 V).
17	TAO	O	Tracking drive output.
18	TA ⊖	I	Inverted input pin of tracking amp.
19	SL ⊕	I	Non-inverted input pin of slider amp.
20	SLO	O	Slider drive output.
21	SL ⊖	I	Inverted input pin of slider amp.
22	S.STOP	I	ON/OFF detection signal input pin of limit switch for innermost track of disc.
23	FSET	I	Setup pin for peak of focus tracking phase compensation, and LPF f_0 of CLV.
24	SENS	O	Output pin for FZC, AS, TZC, SSTOP, BUSY, etc. commands from the CPU.
25	AV_{EE}	–	Power supply (–5 V).
26	C.OUT	O	Signal output for track number counting.
27	DIRC	I	Used when performing 1-track jumping (including 47-kohm pull-up resistor). (Not used in this unit.)
28	XRST	I	Reset input pin. Reset at low level.
29	DATA	I	Serial data input pin from CPU.
30	XLT	I	Latch input pin from CPU.
31	CLK	I	Serial data transfer clock input pin from CPU.
32	D.GND	–	GND for data.
33	BW	I	External-connect time constant pin of loop filter.
34	PDI	I	Input pin for phase comparator output (PDO) of bit PLL.
35	IS=T	I	Applies current which determines the height of the focus search, track jump and slider kick.
36	VCOF	I	The resistance between this pin and pin ㊲ is proportional to the free-running frequency of the VCO.
37	3.5 V	O	3.5 V constant voltage output pin.
38	C864	O	8.64 MHz VCO output pin.
39	LOCK	I	When at low level, slider overrun protection circuit is activated.
40	MDP	I	Drive signal input pin for spindle motor of VC4092.
41	MON	I	ON/OFF signal input pin for spindle motor of VC4092.
42	FSW	I	For external connection of LPF time constant components for CLV servo error signal.
43	DV_{CC}	–	Power supply (+5 V).
44	SPDL ⊖	I	Inverted input pin of spindle drive amp.
45	SPDLO	O	Spindle drive output.
46	WDCK	I	Clock input pin for auto sequencer. Normally input 88.2 MHz.
47	FOK	I	Focus OK signal input pin.
48	MIRR	I	Mirror signal input pin.

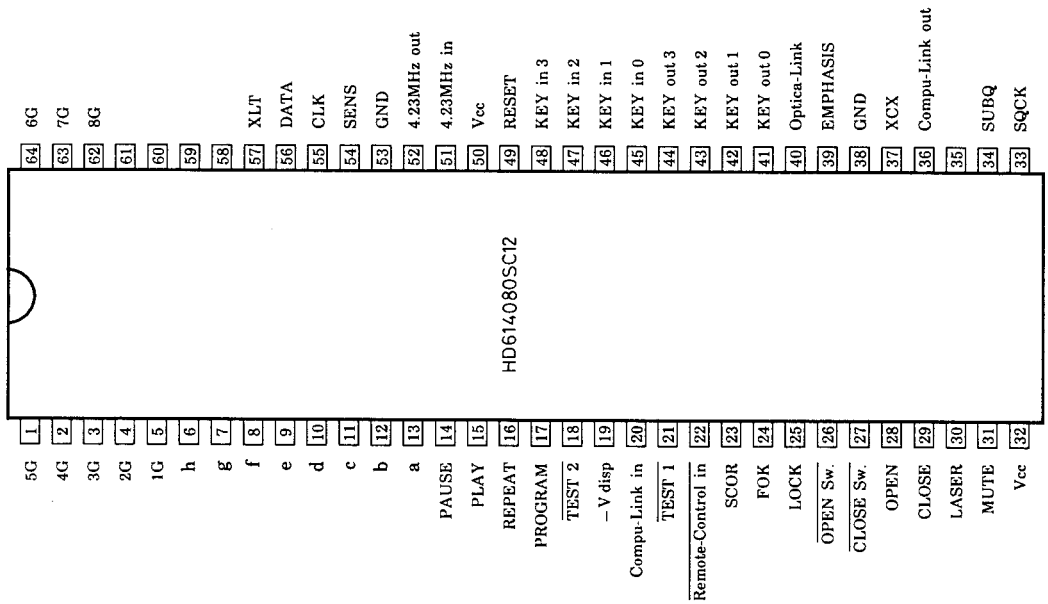
Other LSI ICs and Internal Block Diagrams

■ HD614080SC12 (IC201)

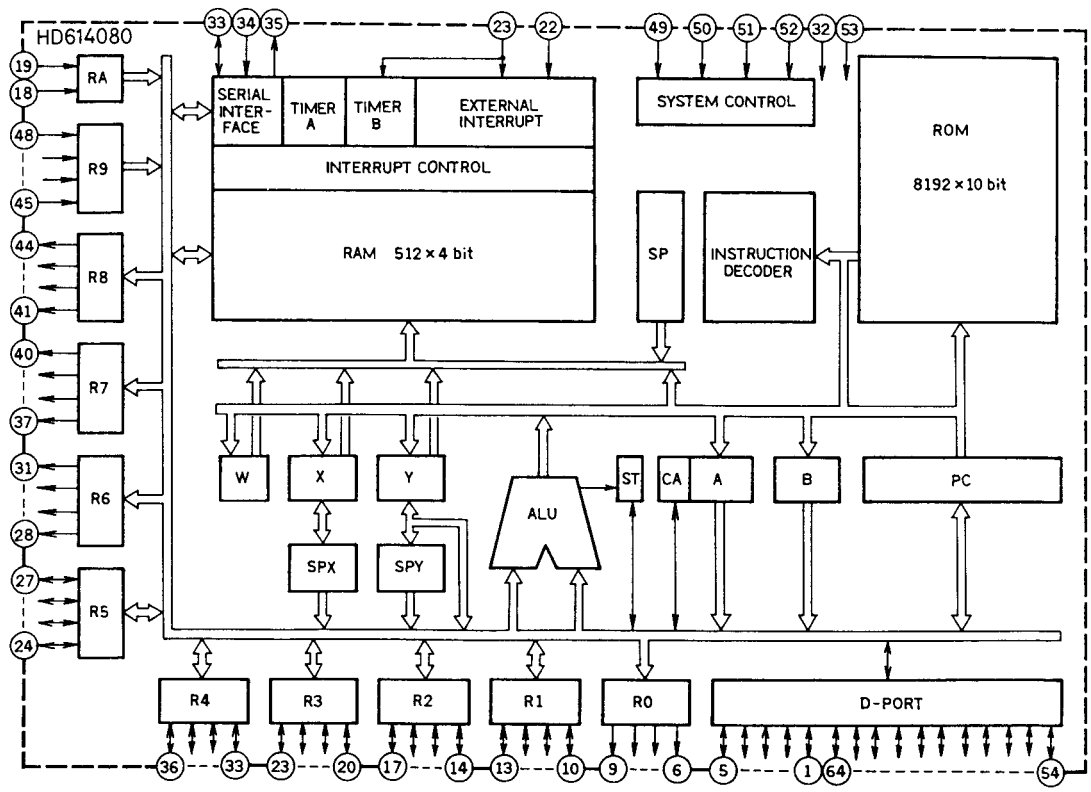
(1) Outline:

This LSI is a C-MOS 4-bit single-chip microcomputer. It consists of a 4096-word x 10-bit ROM, a 256-digit x 4-bit RAM, I/O ports, timer/counter and serial interface. Its major functions are the acceptance of commands from swtiches and the output of commands to the FL display, LED display and servo control LSI, etc.

(2) Appearance (Pin allocations)



(3) Internal block diagram

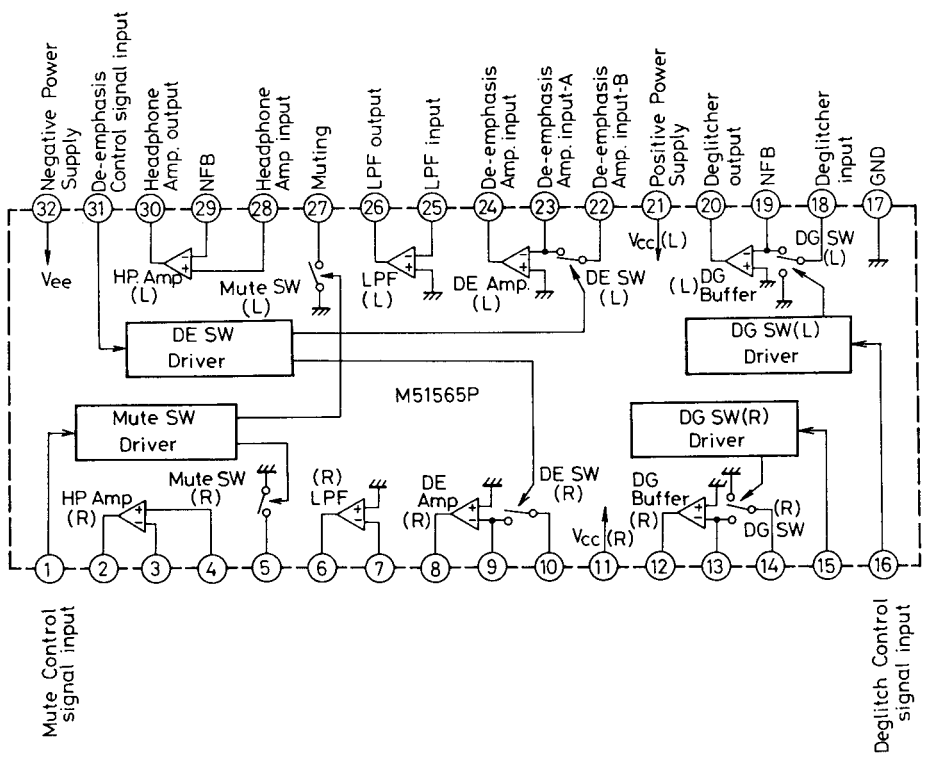


IC201 : HD614080SC12 (System Control)

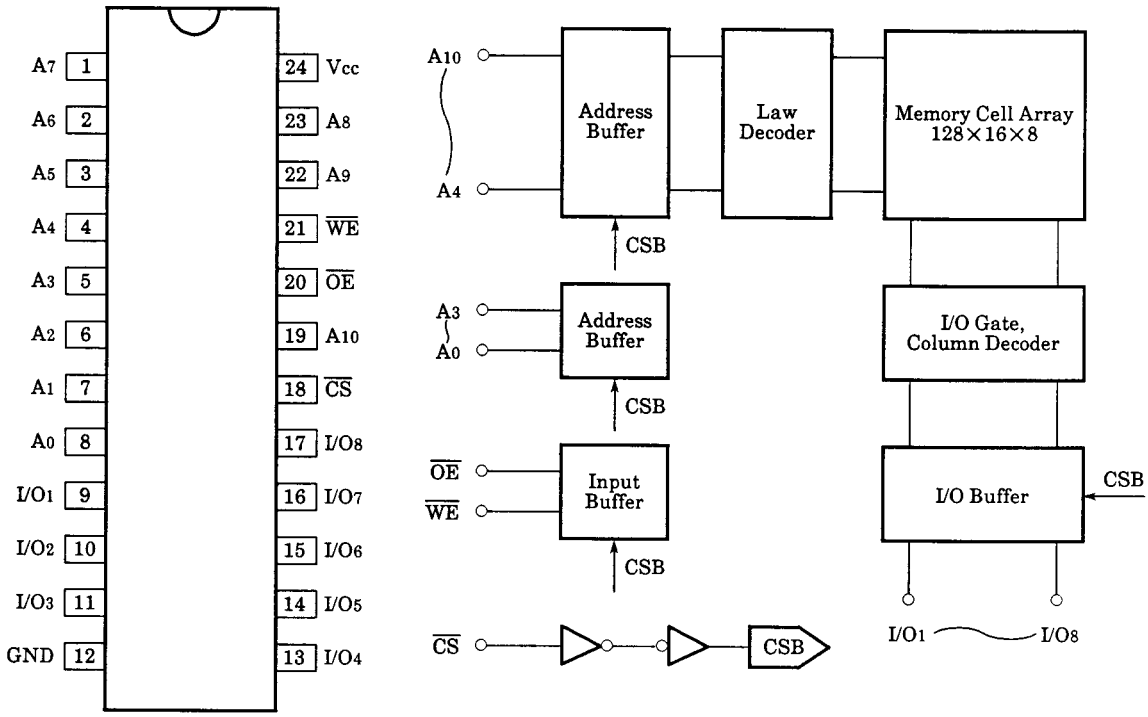
Pin No.	Symbol	Port Form
1	5G	P-MOS open drain, with pull down MOS
2	4G	P-MOS open drain, with pull down MOS
3	3G	P-MOS open drain, with pull down MOS
4	2G	P-MOS open drain, with pull down MOS
5	1G	P-MOS open drain, with pull down MOS
6	h	P-MOS open drain, with pull down MOS
7	g	P-MOS open drain, with pull down MOS
8	f	P-MOS open drain, with pull down MOS
9	e	P-MOS open drain, with pull down MOS
10	d	P-MOS open drain, with pull down MOS
11	c	P-MOS open drain, with pull down MOS
12	b	P-MOS open drain, with pull down MOS
13	a	P-MOS open drain, with pull down MOS
14	PAUSE	P-MOS open drain
15	PLAY	P-MOS open drain
16	REPEAT	P-MOS open drain
17	PROGRAM	P-MOS open drain
18	TEST-2	P-MOS open drain, with pull down MOS
19	-Vdisp	Negative power supply for display
20	Compu-Link in	N-MOS open drain
21	TEST-1	N-MOS open drain, with pull up MOS
22	Remote-control in	N-MOS open drain
23	SCOR	N-MOS open drain
24	FOK	N-MOS open drain
25	LOCK	N-MOS open drain
26	OPEN SW	N-MOS open drain, with pull up MOS
27	CLOSE SW	N-MOS open drain, with pull up MOS
28	OPEN	C-MOS output
29	CLOSE	C-MOS output
30	LASER	C-MOS output
31	MUTE	N-MOS open drain, with pull up MOS
32	Vcc	Power supply

Pin No.	Symbol	Port Form
64	6G	P-MOS open drain, with pull down MOS
63	7G	P-MOS open drain, with pull down MOS
62	8G	P-MOS open drain, with pull down MOS
61	Not use.	P-MOS open drain, with pull down MOS
60	Not use.	P-MOS open drain, with pull down MOS
59	Not use.	P-MOS open drain, with pull down MOS
58	Not use.	P-MOS open drain, with pull down MOS
57	XLT	C-MOS output
56	DATA	C-MOS output
55	CLK	C-MOS output
54	SENS	N-MOS open drain
53	GND	Ground
52	4.23 MHz out	OSC 2
51	4.23 MHz in	OSC 1
50	Vcc	Power supply
49	RESET	Reset
48	KEY in 3	N-MOS open drain, with pull up MOS
47	KEY in 2	N-MOS open drain, with pull up MOS
46	KEY in 1	N-MOS open drain, with pull up MOS
45	KEY in 0	N-MOS open drain, with pull up MOS
44	KEY out 3	N-MOS open drain
43	KEY out 2	N-MOS open drain
42	KEY out 1	N-MOS open drain
41	KEY out 0	N-MOS open drain
40	Optica-Link	N-MOS open drain, with pull up MOS
39	EMPHASIS	C-MOS output
38	GND	N-MOS open drain, with pull up MOS
37	XCX	C-MOS output
36	Compu-Link out	N-MOS open drain
35	Not use.	C-MOS output
34	SUBQ	N-MOS open drain
33	SQCK	C-MOS output

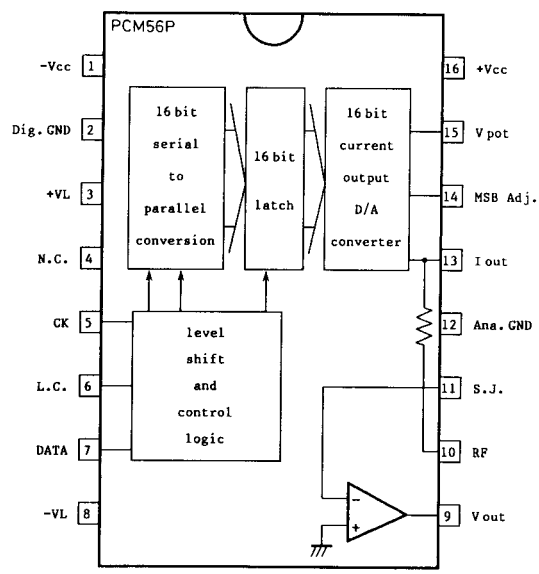
■ M51565P (IC302) : Analog amp



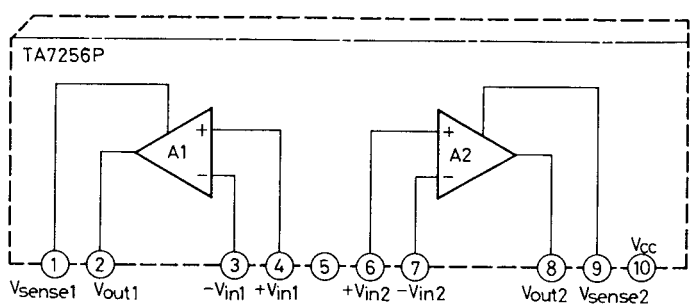
■ **LC3517BS-15 or MB8416A-15L (IC504): static RAM**



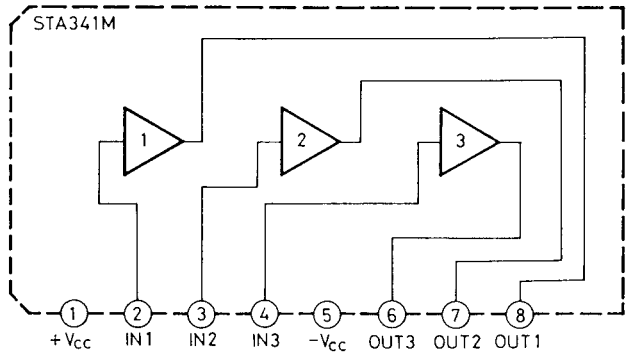
■ **PCM56P (IC301): D/A converter**



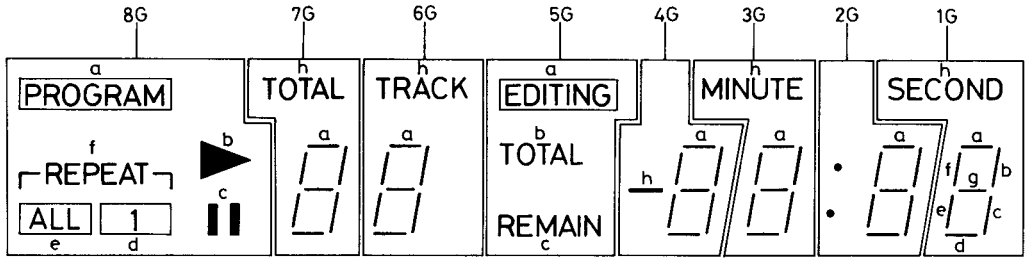
■ **TA7256P (IC506): Dual op amp**



■ STA341A (IC505): Driver array



■ ELU001-056 (FL201): FL Display



FL201 : ELU0001-056
Anode Connection

\	8G	7G	6G	5G	4G	3G	2G	1G
a	PROGRAM	a	a	EDITING	a	a	a	a
b	▶	b	b	TOTAL	b	b	b	b
c	❚❚	c	c	REMAIN	c	c	c	c
d	1	d	d	-	d	d	d	d
e	ALL	e	e	-	e	e	e	e
f	┌REPEAT┐	f	f	-	f	f	f	f
g	-	g	g	-	g	g	g	g
h	-	TOTAL	TRACK	-	—	MINUTE	:	SECOND

Pin Connection

Pin No.	1	2	3	4	5	6	7	8	9
Connection	F	F	NP	8G	7G	NC	NP	6G	5G

Pin No.	10	11	12	13	14	15	16	17	18
Connection	NP	4G	NP	NC	3G	NP	2G	NC	1G

Pin No.	19	20	21	22	23	24	25	26	27
Connection	NP	NC	h	g	NP	f	e	NP	d

Pin No.	28	29	30	31	32	33	34	35
Connection	c	NP	b	a	NP	NP	F	F

Note ····· F: Filament, G: Grid, a~h: Element, NP: No pin, NC: No connection

Disassembly Procedures

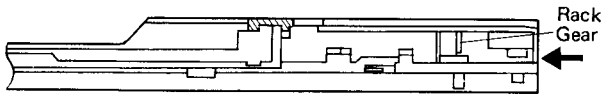
(1) Top cover removal

1. Remove the two screws on each side and the two screws on the rear.
2. Pull the top cover slightly backward and lift it while spreading the back of the left and right sides to remove it.

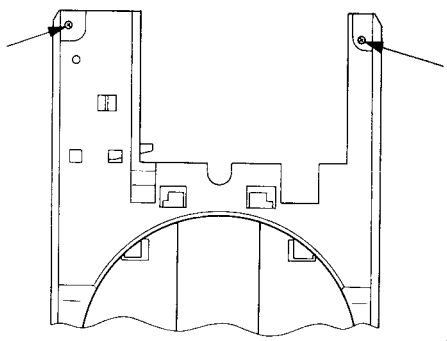
(2) Tray assembly removal

1. Remove the top cover as described in (1).
2. Turn the power on and press the OPEN/CLOSE button to move the tray out. Now turn the power off.

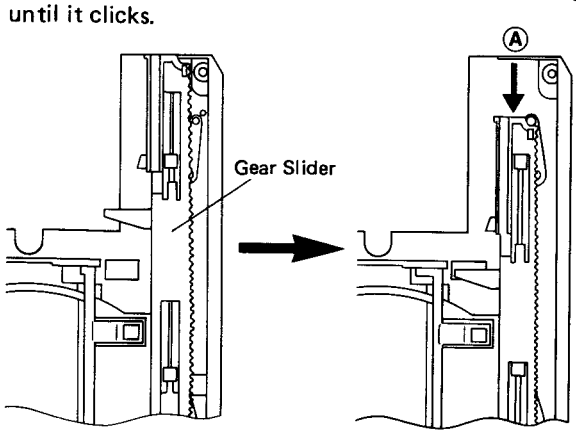
Note: If the power cannot be turned on due to a malfunction, push the rear end of the rack gear toward front forcibly to move out the tray.



3. Remove the tray retaining screws and remove the tray by pulling it forward.



4. When reassembling, if the gear slider is not fully forward, slide it forward (in the direction of the arrow Ⓐ) until it clicks.



(3) Front panel assembly removal

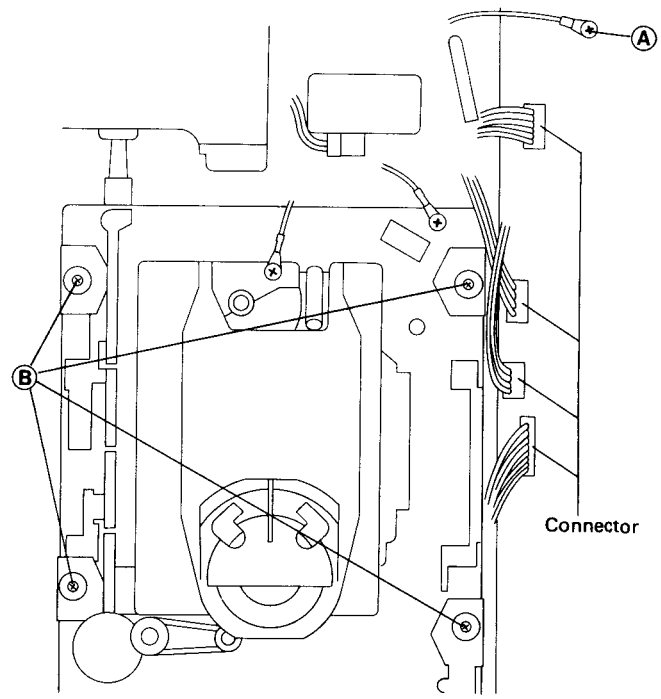
1. Remove the top cover as described in (1), and the tray assembly as described in (2).
2. Remove the plastic rivets on the left and right sides.
3. Now lift so the bottom panel is accessible and remove the three screws from the bottom of the front panel.
4. The front panel can now be detached; release the claws holding the switch PC board and the bracket retaining the headphone jack to remove completely.

(4) Main PC board removal

1. Remove the front panel assembly as described in (3).
2. Remove the four screws retaining the main printed circuit board; one of these is used to fasten the lug at the end of the ground lead from the mechanism.
3. Remove the two screws securing the output terminals and the COMPU LINK/SYNCHRO terminal on the rear panel.
4. Remove three plastic rivets retaining switch PC board (lower) to the chassis, and remove the switch PC board from the chassis by releasing the catch securing the switch PC board.
5. Lift up the main PC board to remove it.

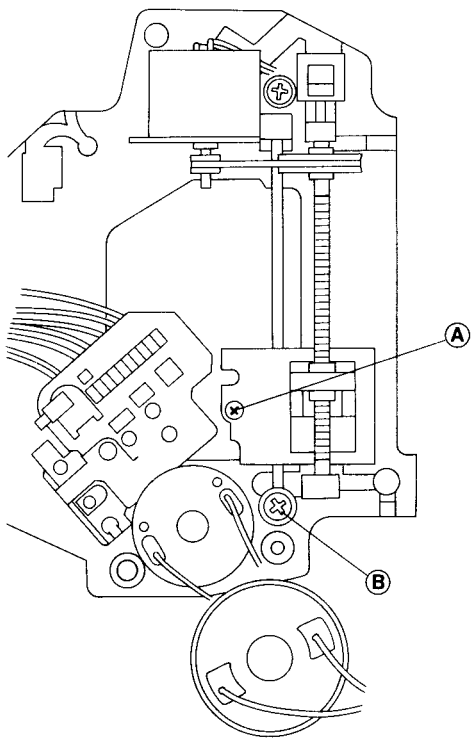
(5) Mechanism assembly removal

1. Remove the top cover as described in (1), and the tray assembly as described in (2).
2. Unplug the two green socket connectors and release the two other connectors from the PCB by lifting their catches with a screwdriver.
3. Unscrew the ground connector from the PCB. (Ⓐ)
4. Remove the four copper-plated screws Ⓑ connecting the mechanism assembly to the chassis and lift the mechanism assembly to remove it.



(6) Laser pickup removal

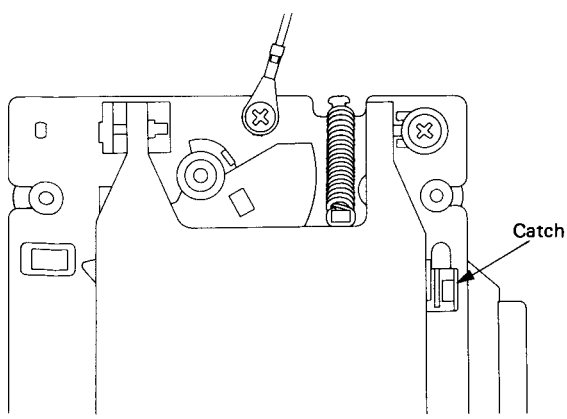
1. Remove the top cover, tray assembly and the mechanism assembly as described above.
2. Turn the mechanism upside down.
3. Remove the screw Ⓐ from the center of the pickup base assembly.
4. Lift the plastic actuator and slide to remove it.
5. Slide the pickup assembly to the center and remove the washer-head screw Ⓑ retaining the pickup assembly and sliding shaft.



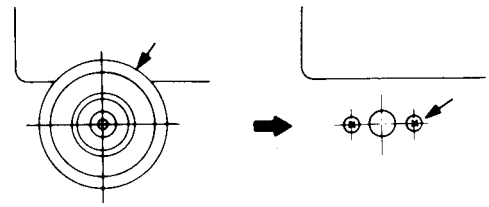
Note:
When disassembling and reassembling, be careful not to get grease on the rubber belt that runs round the pulley.

(7) Spindle motor removal

1. Remove the mechanism assembly as described above.
2. Release the catch holding the disc clamper, and raise the disc clamper straight up (at a right angle).

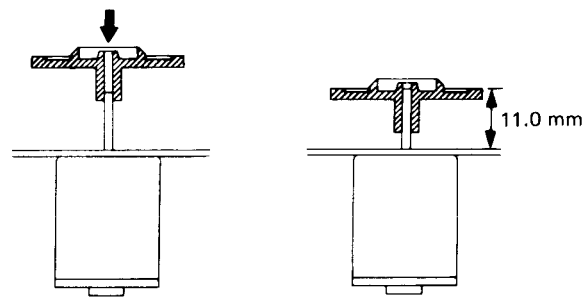


3. Remove the turntable, and remove the two screws retaining the spindle motor.

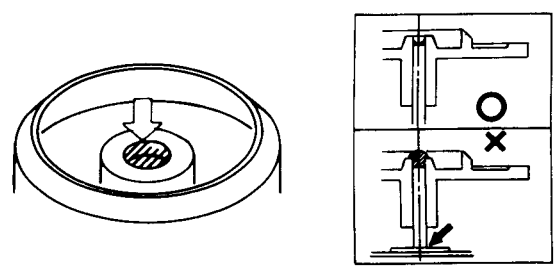


Note: Installation of the spindle motor

1. Secure the two screws, applying uniform tightening torque.
2. Insert the turntable by pressing it.
   The turntable must be inserted straight while supporting the motor at its lowest section; alignment must be accurate to obtain a height of 11.0 mm above the top surface of the mechanism base.

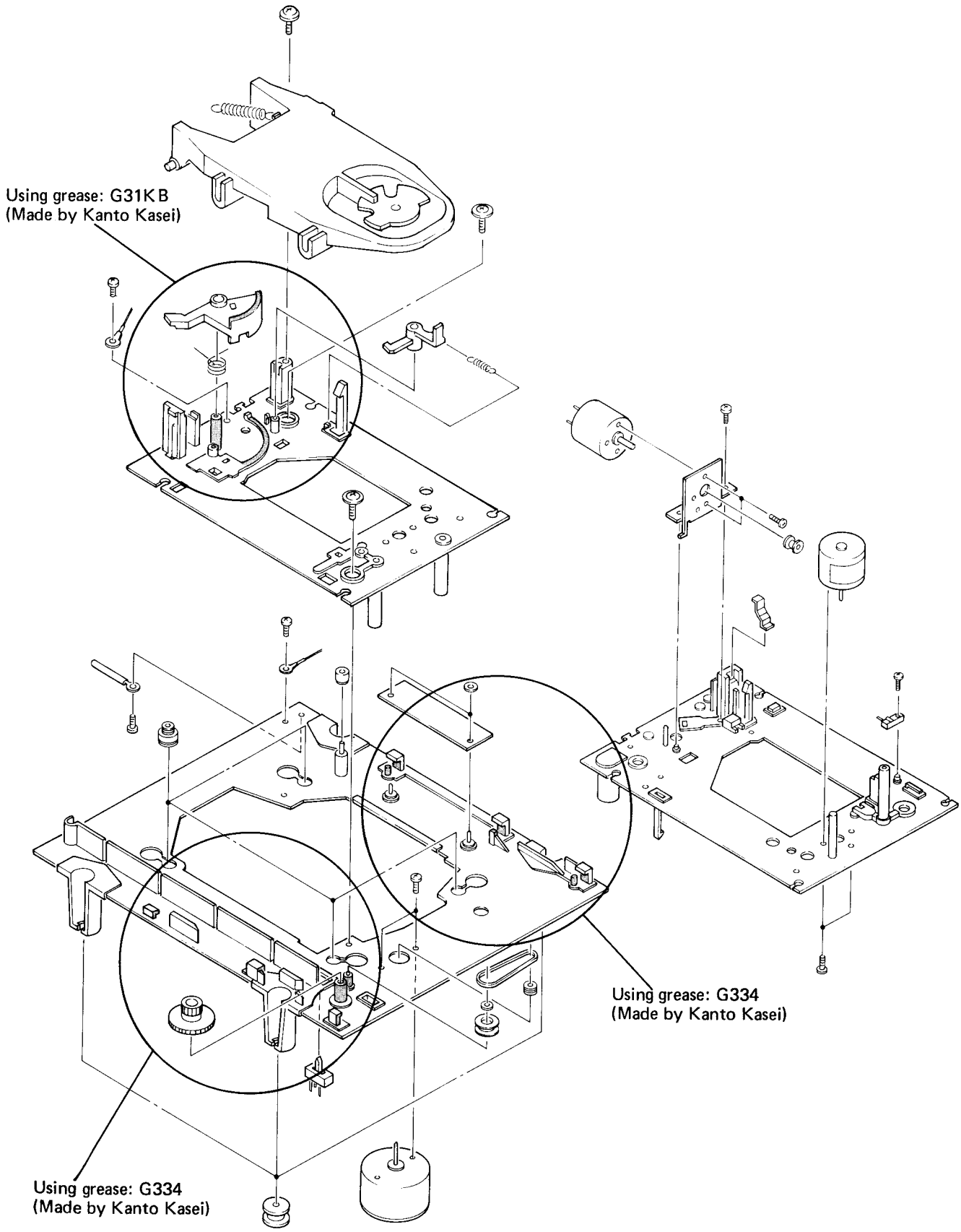


3. After insertion is complete, bond the motor shaft and turntable together (at the section marked by an arrow in the figure on the left below).



Use "LOCKTITE #460" boanding agent and use as little as possible. Take care not to allow any excess bonding agent to get onto the turntable, as shwn in the figure (above). Be extremely careful not to allow bonding agent to adhere to the motor bearings (section marked by an arrow in the figure on the right above).

Application Points for Grease



Maintenance of Laser Pickup

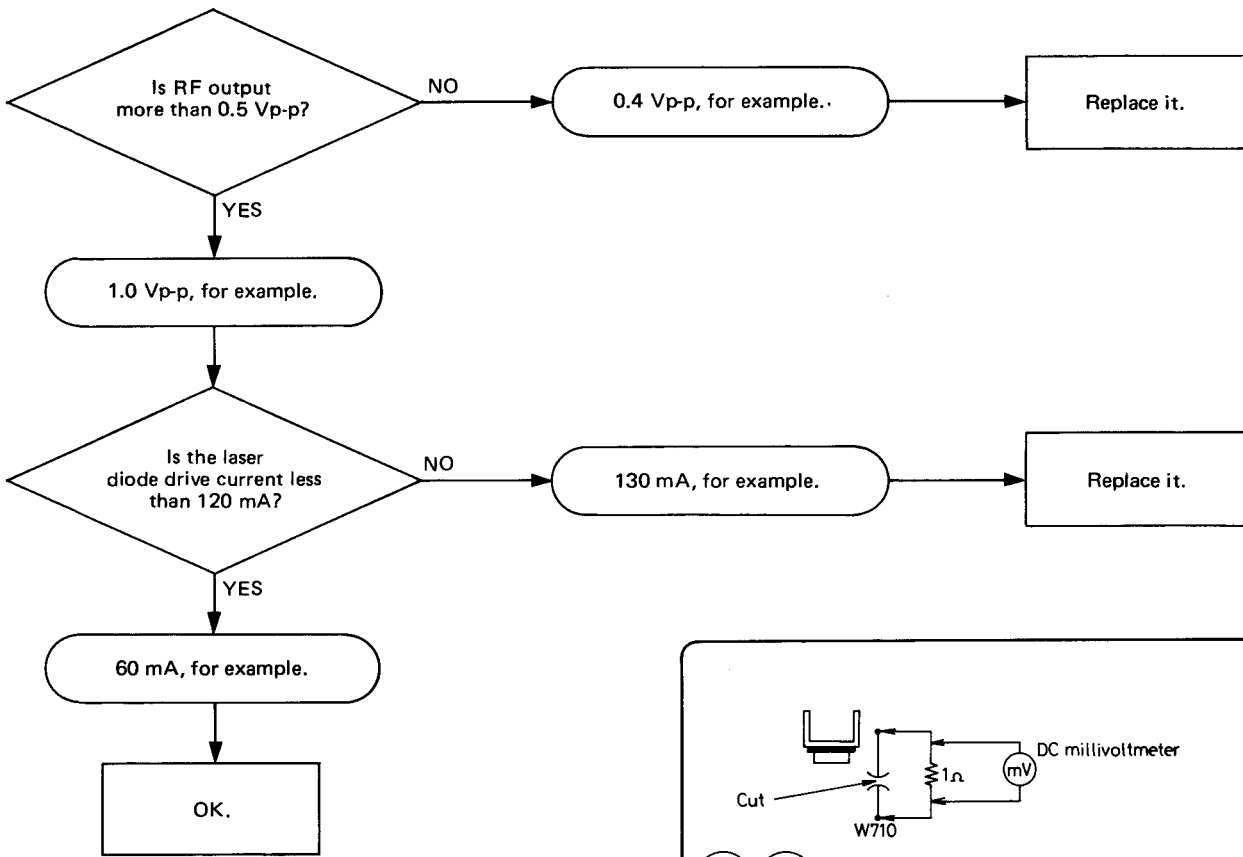
(1) Laser diode life check

When the service life of the laser diode has expired, the following symptoms will appear.

(1) The level of RF output (EFM output: amplitude of eye pattern) will be lowered.

(2) The drive current required by the laser diode will be increased.

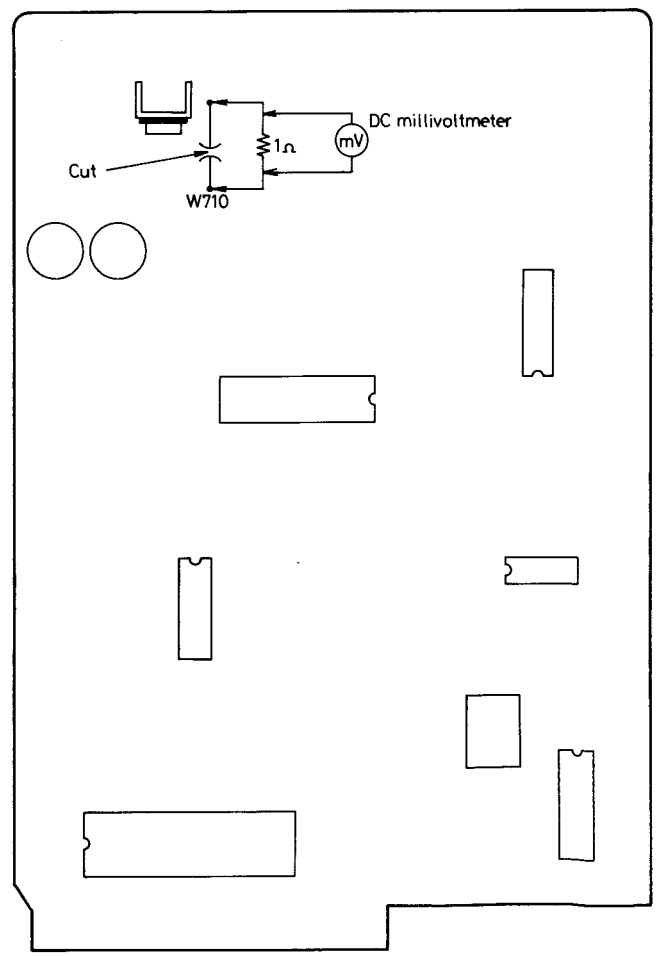
In such a case, check the service life of the laser diode following the flowchart below.



(2) Measurement of laser diode drive current

Cut the jumper wire (W710) shown in the figure on the right using pliers, etc., and solder a 1-ohm resistor between the two ends.

Measure the voltage across the resistor with a millivoltmeter. When the voltage is more than 120 mV, it shows that the service life of the laser diode has expired.



(3) Semi-fixed resistor on the APC PC board

The semi-fixed resistor on the APC printed circuit board which is attached to the pickup is used to adjust the laser power. Since this adjustment should be performed to match the characteristics of the whole optical block, do not touch the semi-fixed resistor.

If the laser power is lower than the specified value, the laser diode is almost worn out, and the laser pickup should be replaced. If the semi-fixed resistor is adjusted while the pickup is functioning normally, the laser pickup may be damaged due to excessive current.

Replacement of Laser Pickup

After checking that the POWER switch is turned OFF, disconnect the power cord from the AC outlet.

Replace the pickup with a normal one. (Refer to "Laser Pickup Removal" on the previous page, and the photo on the right.)

Plug in the power cord, and turn the POWER switch ON. At this time, check that the laser is emitted for about 3 seconds and the objective lens moves up and down.
Note: Do not observe the laser beam directly.

Play a disc, and when it starts rotating, short-circuit between TP8 (TEST 1) and TP9 (GND).

Perform EF balance adjustment.

Remove TP8 (TEST 1) from TP9 (GND).

Perform tracking gain adjustment.

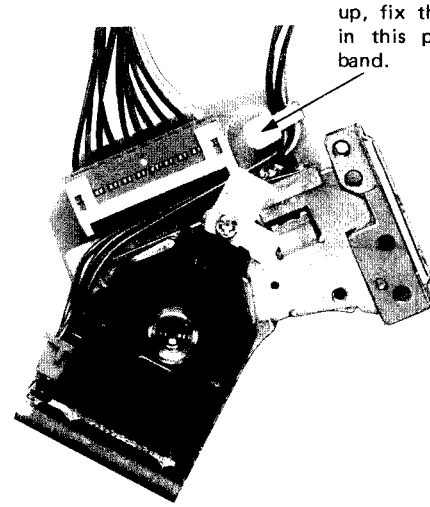
Check that the eye-pattern waveform is observed at TP1 (RF).

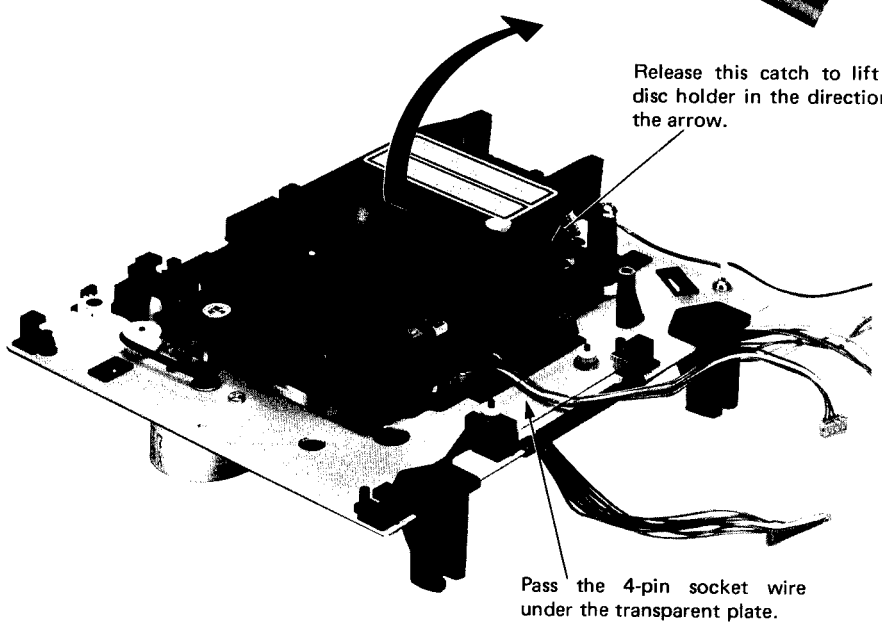
Perform focus offset adjustment.

Perform focus gain adjustment.

Replacement is now complete.

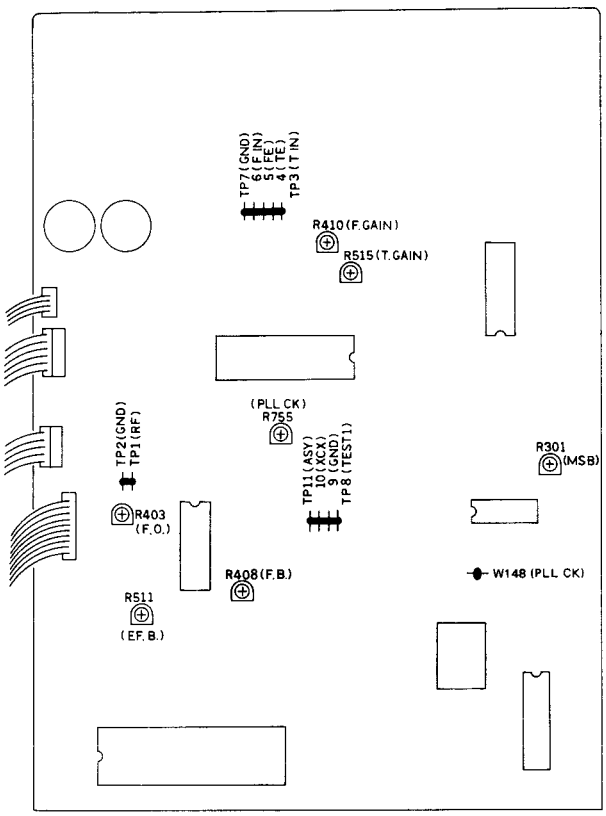
Note:
Since one adjustment may affect other settings, repeat these adjustments a few times.




Release this catch to lift the disc holder in the direction of the arrow.
Pass the 4-pin socket wire under the transparent plate.

Adjustment Procedures

Locations of Parts to be Adjusted



(1) PLL Freerunning Adjustment

1) Adjustment instruments
   Frequency counter, Test disc (CRG1106)
2) Adjustment procedure
   1. Turn the POWER switch ON.
   2. Short-circuit between TP11 (ASY) and TP9 (GND).
   3. Connect a frequency counter to W148 (PLL CK) and TP7 (GND).
   4. Adjust R755 (PLL CK) so that the frequency counter reads 4.322 ±0.005 MHz.
   5. Release short-circuit between TP11 and TP9.
   6. Load a test disc and press the PLAY button.
   7. Check that the frequency counter reads 4.322 MHz.

(2) Offset Adjustment

1) Adjustment instruments
   Oscilloscope, Test disc (CRG1106)
2) Adjustment procedure
   1. Turn the POWER switch ON.

   <**Focus bias**>
   2. Connect an oscilloscope to TP5 (FE) and TP7 (GND).
   3. Adjust R408 (F.B.) so that the voltage at TP5 becomes 0 V (less than 10 mV).

   <**EF balance**>
   4. Remove the oscilloscope from TP5 (FE), and connect it to TP4 (TE).
   5. Short-circuit between TP8 (TEST1) and TP9 (GND).
   6. Load a test disc and press the PLAY button.
   7. Adjust R511 (EF. B.) so that the center of the waveform at TP4 (TE) becomes 0 V.

   <**Focus offset**>
   8. Release short-circuit between TP8 and TP9.
   9. Press the PLAY button to play the normal disc.
   10. Remove the oscilloscope from TP5 (FE) and TP7 (GND), then connect it to TP1 (RF) and TP2 (GND).
   11. Adjust R403 (F.O.) so that the amplitude of the waveform at TP1 (FE) becomes maximum and clearest eye-pattern is obtained.

(3) Gain Adjustment

A 2-needle VTVM and special oscillator are required in order to perform this adjustment exactly. However, these values have a margin, so even if it is slightly off, there is no problem. Therefore, it is not required to perform this adjustment after replacing the pickup.

If the gain is out of adjustment, the symptoms below will appear.

- Gain too low
  - Focus gain: Focus is not obtained and disc does not rotate.
  - Tracking gain: Mechanical shock occurs easily and sound is interrupted. Or time counter display stops counting.
- Gain too high
  - Focus gain: Scratches (on the disc) easily interrupt play, and noise is increased during play.
  - Tracking gain: Since the follow-up ability of the pickup is too high, the pickup may oscillate and oscillating sound may output.

As described above, the focus and tracking gain adjustments are performed so as to satisfy mutually countradictory characteristics.
The simplified adjustment procedure is described below. However, since exact adjustment cannot be performed, note (or mark) the positions of the semi-fixed VRs before making the following adjustments.
If the positions after the simplified adjustment are only slightly different, return the VRs to their original positions.

1) Adjustment instruments
   Oscilloscope, Test disc (CRG1106)
2) Adjustment procedure
   1. Keep the set horizontal. (To reduce the effects of gravity and moment which may make this adjustment impossible.)
   2. Turn the POWER switch ON.

   <**Focus gain**>
   3. Connect an oscilloscope to TP5 (FE) and TP7 (GND).
   4. Load a test disc and press the PLAY button.
   5. Adjust R410 (F. GAIN) so that the correct waveform as shown in the figure is obtained.

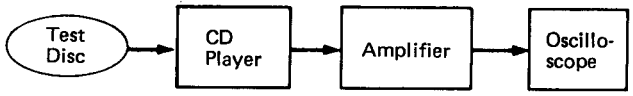
   <**Tracking gain**>
   6. Remove the oscilloscope from TP5 (FE), and connect it to TP4 (TE).
   7. Adjust R515 (T.GAIN) so that the correct waveform as shown in the figure on the next page is obtained.

(4) Zero-Cross Distortion Adjustment (MSB*)

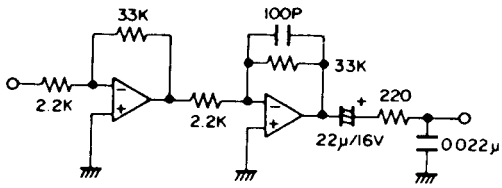
1) Adjustment instrument
   Oscilloscope, Test disc (CRG1106), Amplifier (amplification of approx. 47 dB)
2) Adjustment procedure
   1. Connect an amplifier and an oscilloscope to the output of the player.
   2. Turn the POWER switch ON.

3. Load the test disc and play track 9 (1 kHz, -60 dB).
4. Adjust R301 (MSB) so that the correct sine wave as shown in the figure is obtained.

*MSB: Most Significant Bit



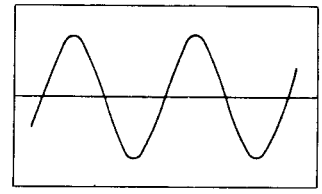
* The amplifier can be replaced with a level meter, etc.



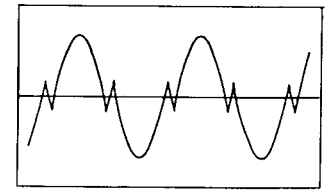
Recommended amplifier circuit (approx. 47 dB)

* Use NJM4560DX or M5220 for op amp.

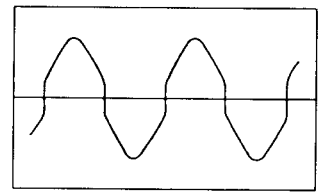
Zero-cross distortion waveform



OK



Unacceptable



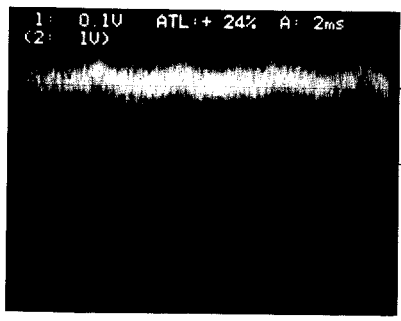
Unacceptable

Focus gain adjustment

Optimum focus gain

100 mV/div 2ms/div

Low focus gain



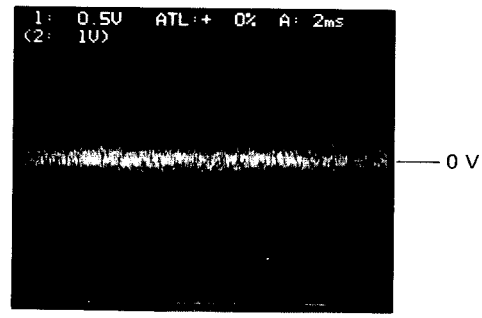
100 mV/div 2 ms/div

High focus gain

100 mV/div 2 ms/div

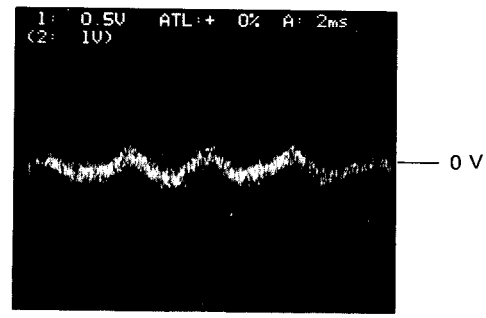
Tracking gain adjustment

Optimum tracking gain



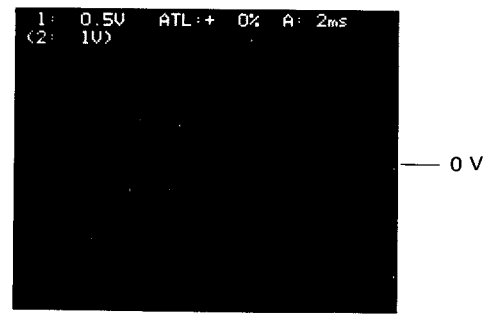
500 mV/div 2 ms/div

Low tracking gain



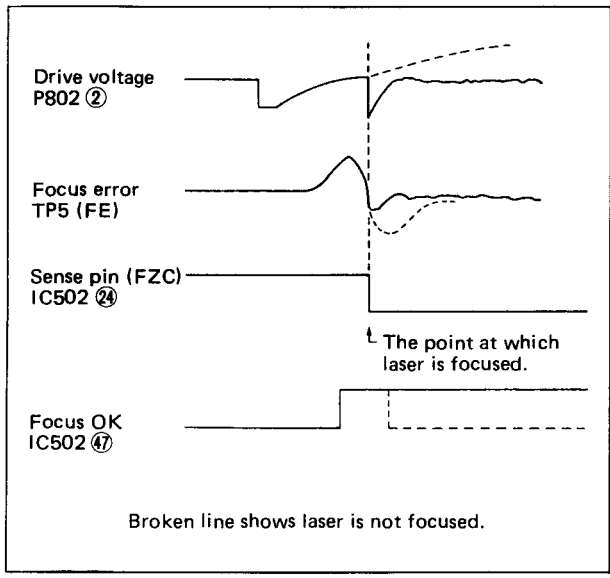
500 mV/div 2ms/div

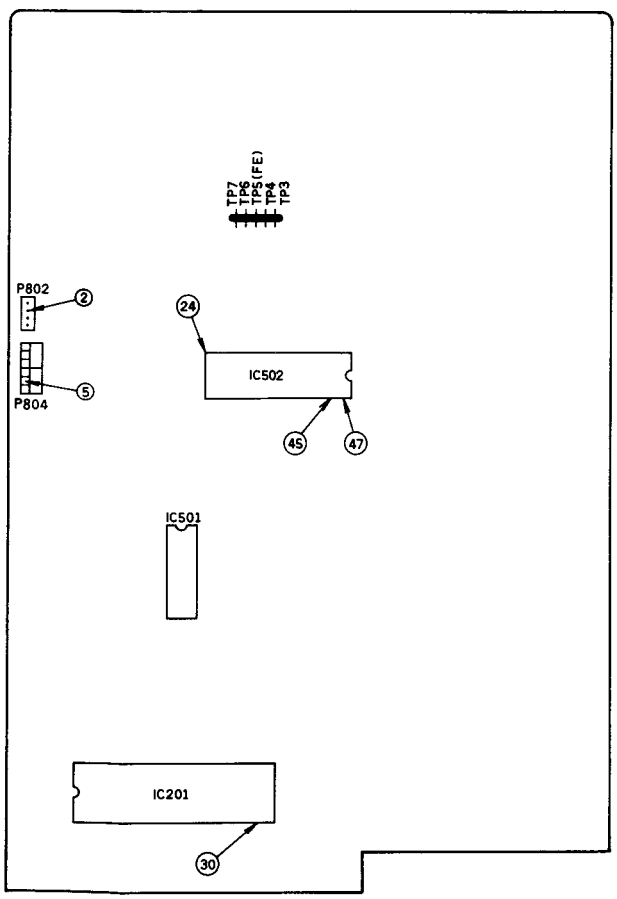
High tracking gain

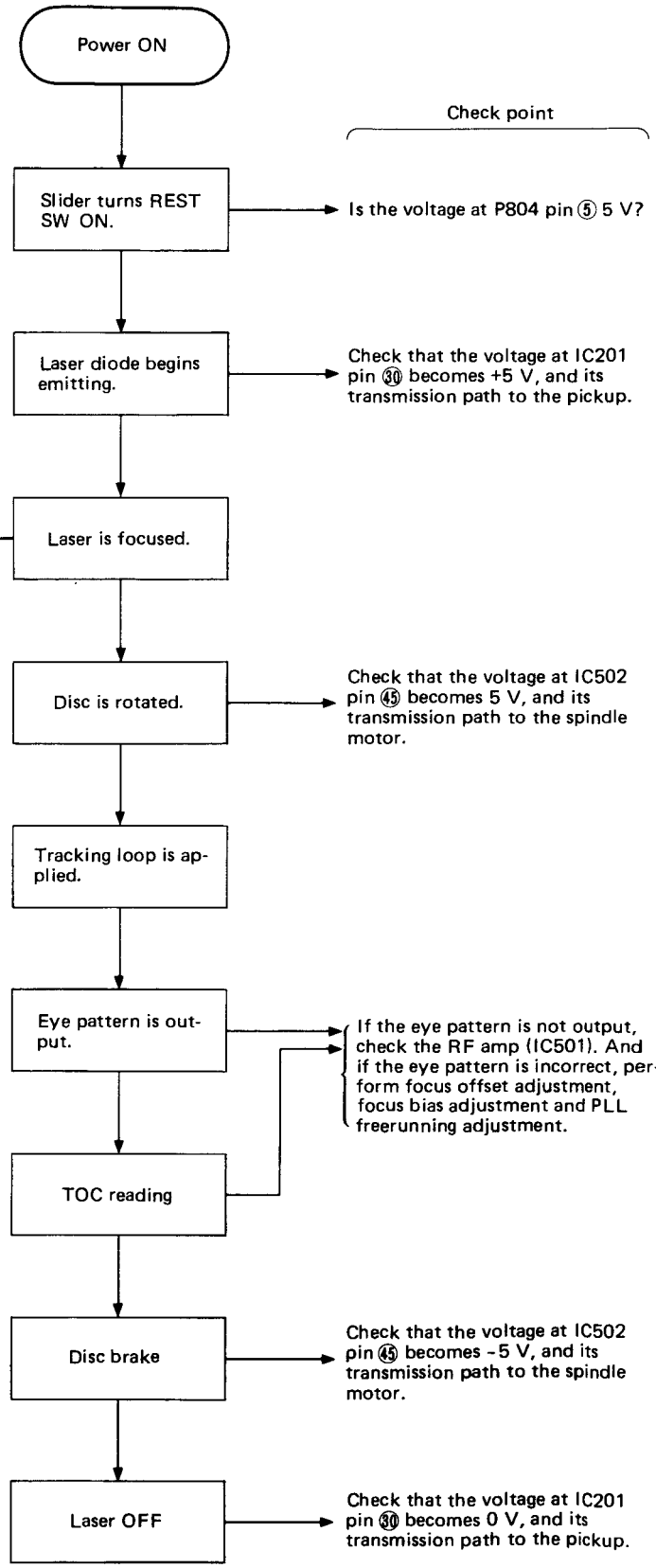


500 mV/div 2 ms/div

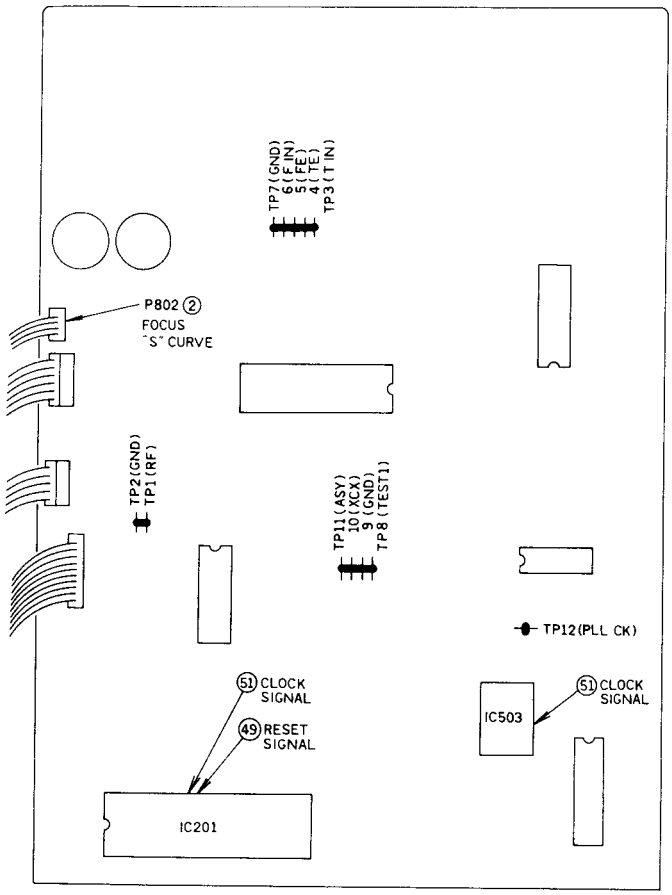
Flow of Operation Until TOC is Read






Power ON
Check point
Slider turns REST SW ON.
Is the voltage at P804 pin ⑤ 5 V?
Laser diode begins emitting.
Check that the voltage at IC201 pin ㉚ becomes +5 V, and its transmission path to the pickup.
Laser is focused.
Disc is rotated.
Check that the voltage at IC502 pin ㊺ becomes 5 V, and its transmission path to the spindle motor.
Tracking loop is applied.
Eye pattern is output.
If the eye pattern is not output, check the RF amp (IC501). And if the eye pattern is incorrect, perform focus offset adjustment, focus bias adjustment and PLL freerunning adjustment.
TOC reading
Disc brake
Check that the voltage at IC502 pin ㊺ becomes -5 V, and its transmission path to the spindle motor.
Laser OFF
Check that the voltage at IC201 pin ㉚ becomes 0 V, and its transmission path to the pickup.

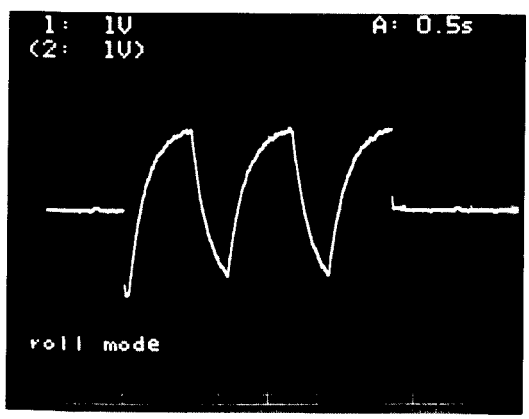
Principal Waveforms



Locations of waveform measurement points

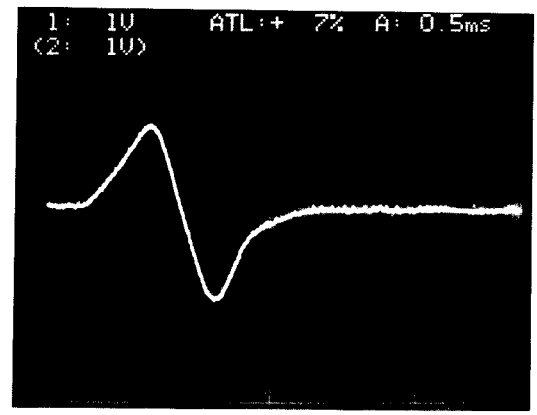
(1) Focus drive voltage during focus search after disc tray is closed. (With no disc)

P802 ②



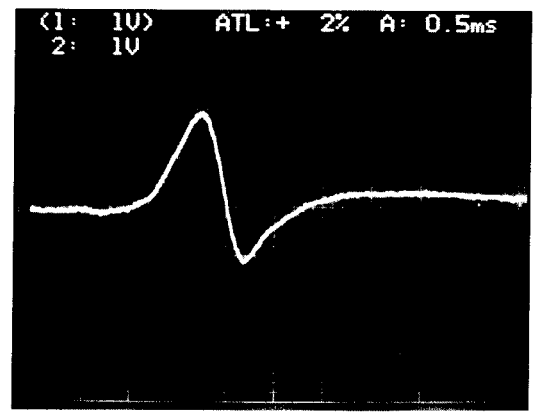
1 V/div 0.5 s/div

(2) S curve during focus search
Waveform at TP5 (FF) with short-circuit between TP6 (F IN) and TP7 (GND)



1 V/div 0.5 ms/div

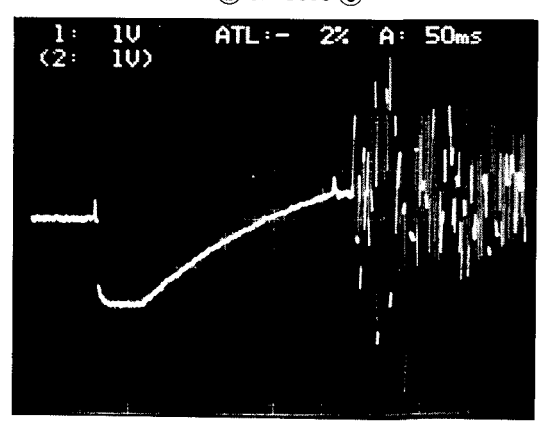
(3) S curve when focus servo is being applied. (When short-circuit between TP6 and TP7 is released.)



1 V/div 0.5 ms/div

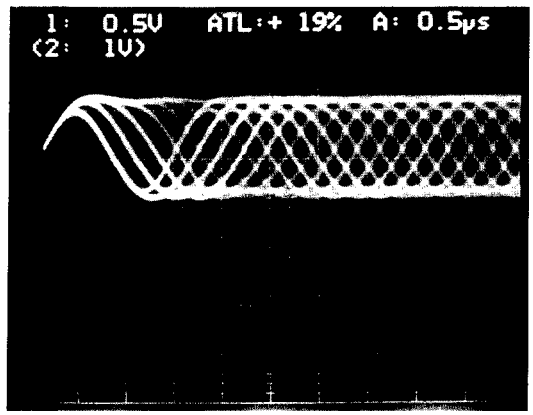
(4) Focus drive waveform when focus servo is being applied.

P802 ② or IC505 ⑧



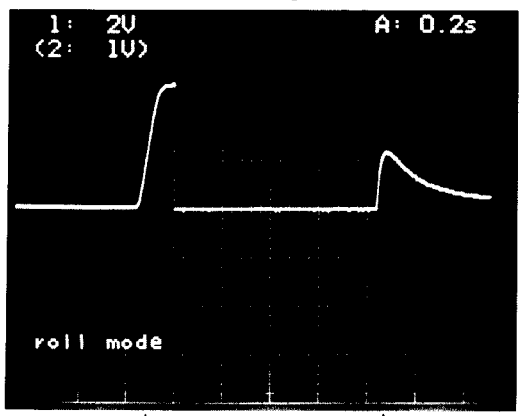
1 V/div 50 ms/div

(5) RF waveform (Eye pattern)
Waveform between TP1 (RF) and TP2 (GND)



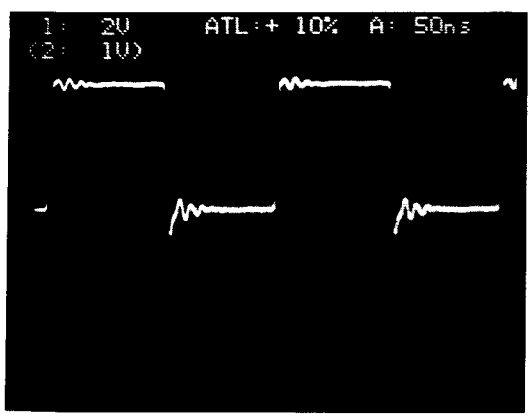
1 V/div 0.5 μs/div

(6) Microcomputer reset waveform when the power is turned ON/OFF
IC201 (49)



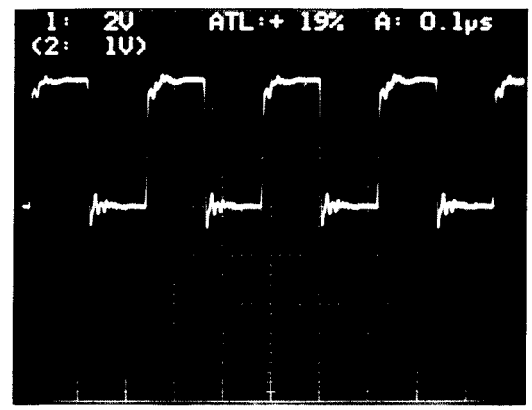
ON OFF 1V/div 0.2 s/div

(7) PLL clock waveform
Waveform at TP12 (PLL CK) with short-circuit between TP11 (ASY) and TP9 (GND). (in the stop mode)



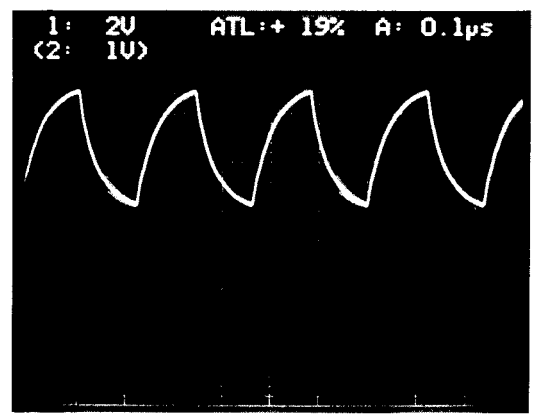
1 V/div 50 ns/div

(8) Clock waveform of microcomputer
IC503 (51)



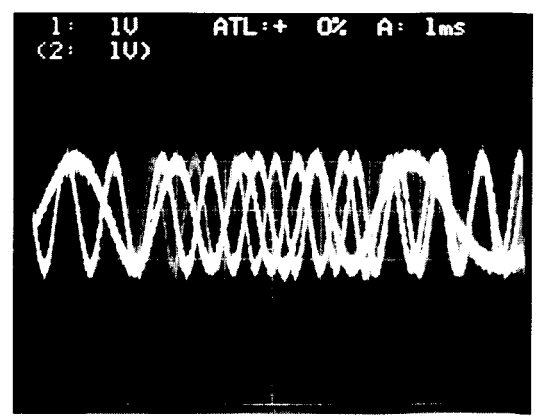
1 V/div 0.1 μs/div

(9) Clock waveform of microcomputer
IC201 (51)



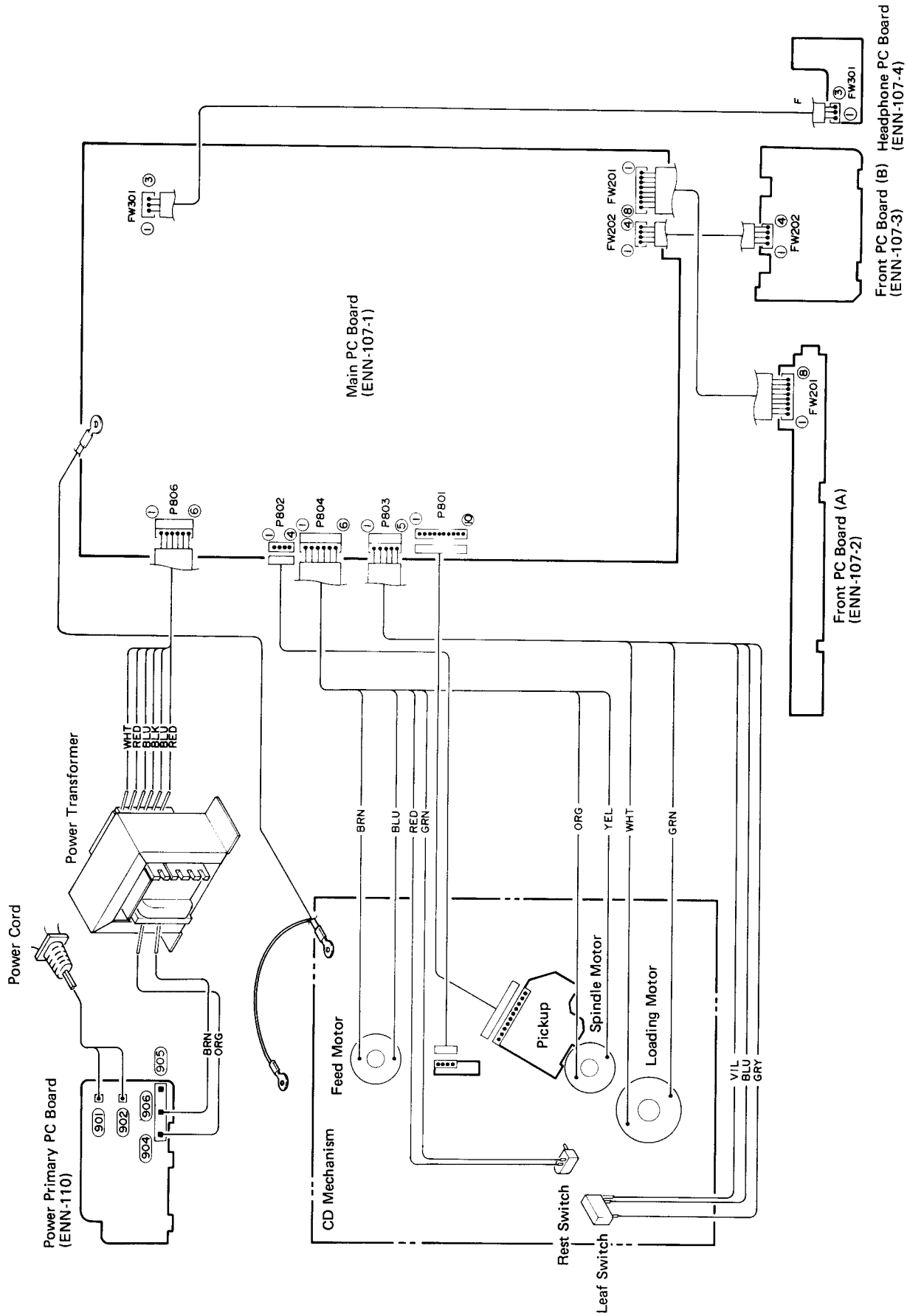
1 V/div 0.1 μs/div

(10) Tracking error waveform in the test mode (when tracking loop is OFF)
Waveform at TP4 (TE) when short-circuiting between TP8 (TEST) and TP9 (GND)



1 V/div 1 ms/div

Connection Diagram



PARTS LIST

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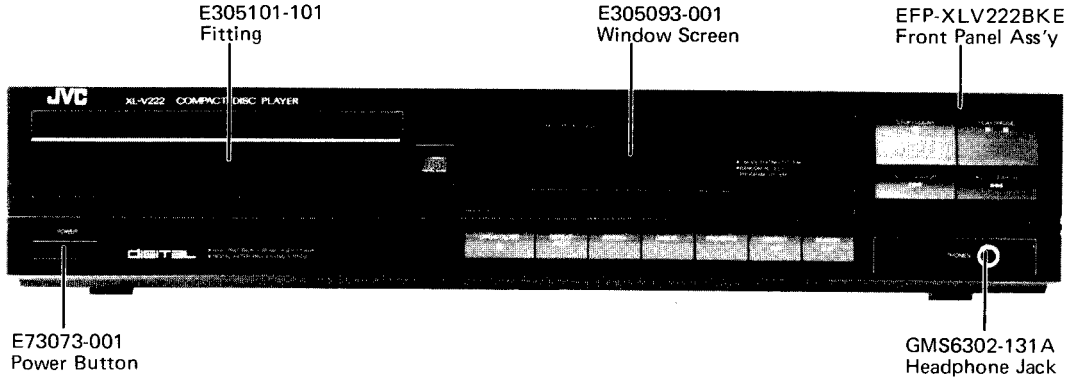
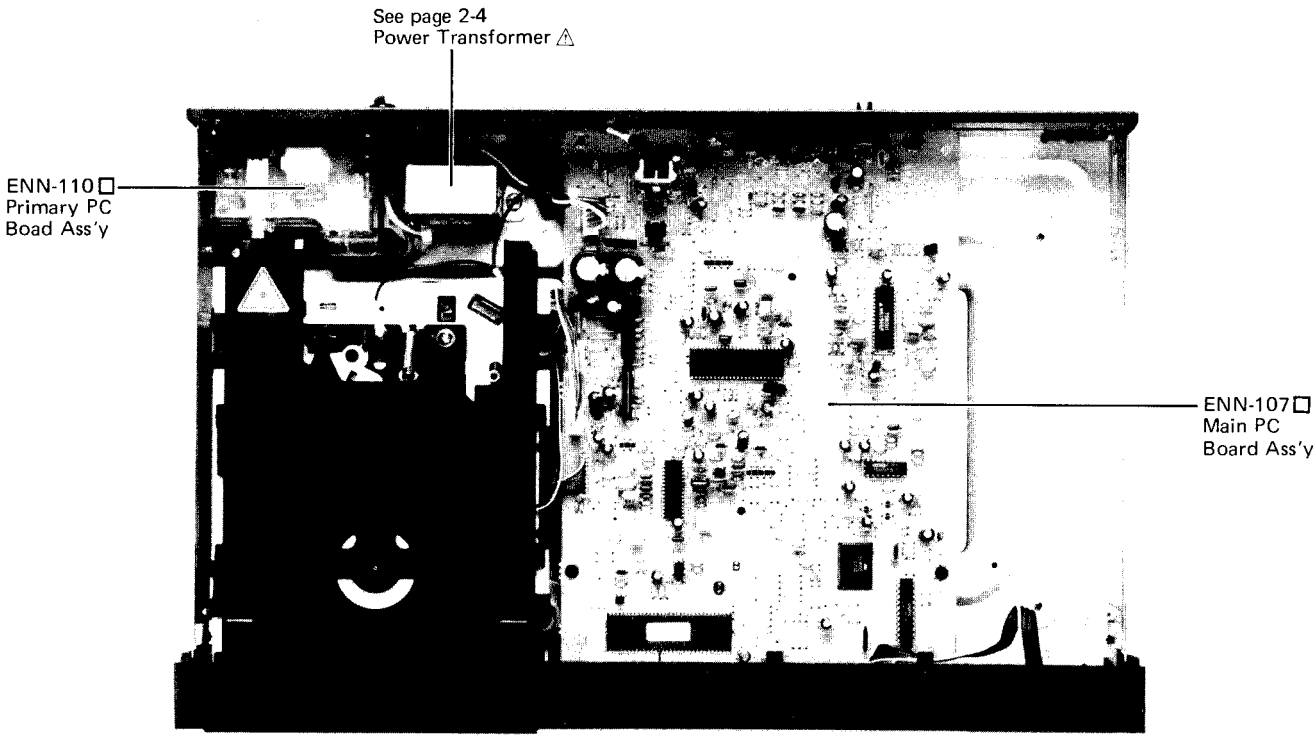
Main Parts Locations

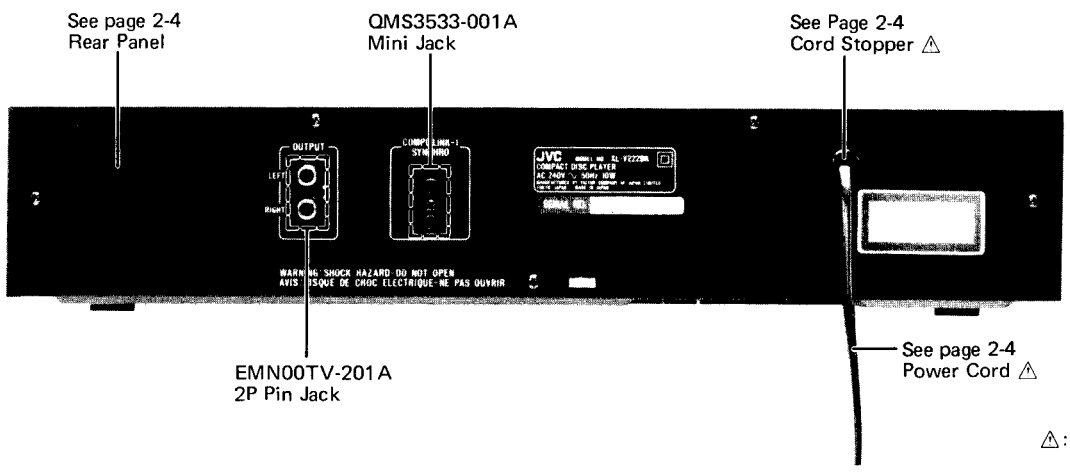
■ Front View



■ Top View

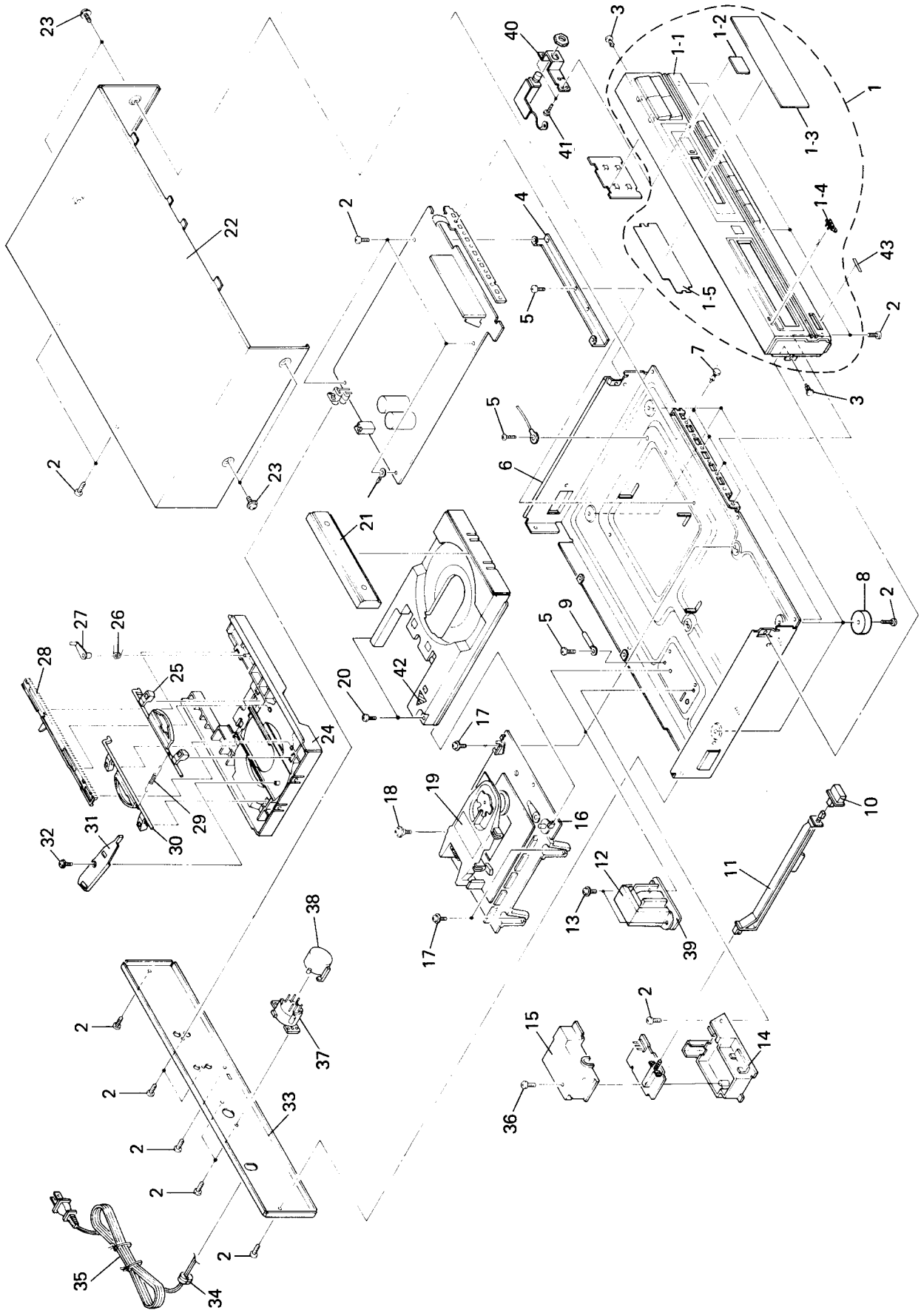


■ Rear View



⚠: Safety Parts

Exploded View and Parts List



■ Parts List

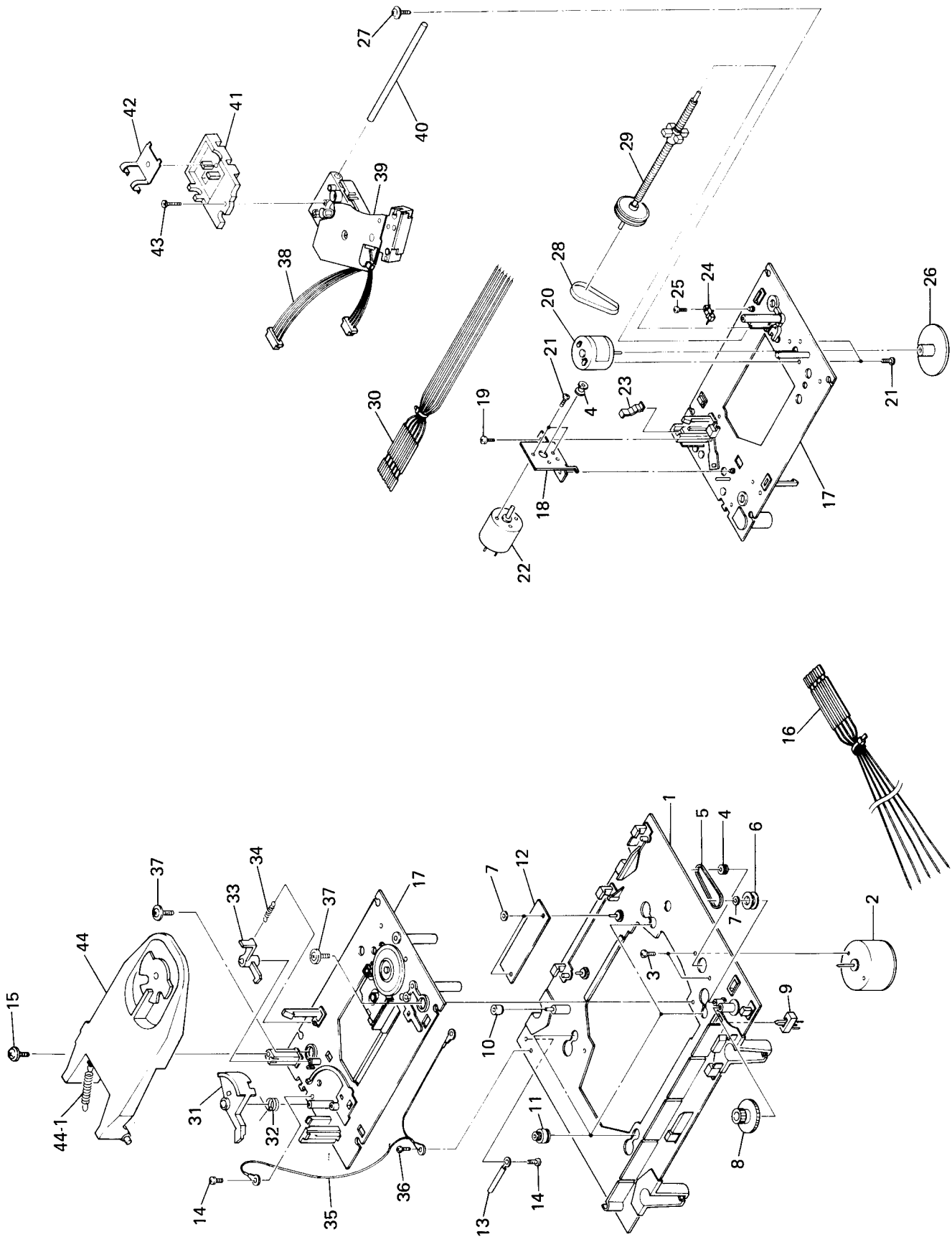
⚠	Item	Part Number	Part Name	Q'ty	Description	Areas
	1	EFP-XLV222BKE	Front Panel Ass'y	1		
	1-1	E25928-002	Front Panel	1		
	1-2	E74497-001	Ornament	1		
	1-3	E305093-001	Window Screen	1		
	1-4	E72968-001	JVC Mark	1		
	1-5	E74499-002	FL Screen	1		
	2	SBSE3008M	Screw	21		
	3	E48729-009	Plastic Rivet	2		
	4	E305225-001	PC Board Bracket	1		
	5	SDSE3006M	Screw	3		
	6	E11621-002	Chassis Base	1		
	7	E48729-016	Plastic Rivet	4		
	8	E47227-026	Foot	4		
	9	E72018-001	Wire Clamp	1		
	10	E73073-001	Power Button	1		
	11	E305081-101	Push Shaft	1		
⚠	12	ETP1010-37JA	Power Transformer	1		J, C
		ETP1010-37MA	Power Transformer	1		P, PG, U
		ETP1010-37EA	Power Transformer	1		E, EF, A, G
		ETP1010-37EABS	Power Transformer	1		BS
	13	E65389-006	Screw	2		
	14	E25874-003	PC Board Case	1		Except for J, C
		E25874-004	PC Board Case	1		J, C
	15	E25875-001	PC Board Cover	1		Except for J, C
		E25875-001	PC Board Cover	1		J, C
	16	———	Mechanism Base Ass'y	1	See page 2-5.	
	17	E73265-003	Screw	3		
	18	E74727-001	Screw	1		
	19	E303875-002	Caution Label	1		
	20	SBSF3012Z	Screw	2		
	21	E305101-101	Fitting	1		
	22	E25887-001	Metal Cover	1		
	23	E61660-004	Screw	4		
	24	E11557-005	Tray	1		
	25	E304989-002	Lifter	1	Left	
	26	E74328-001	Spring	1	Lifter	
	27	E74327-003	Lock Lever	1		
	28	E304987-004	Rack	1		
	29	E74350-001	Spring	1	Lifter	
	30	E304990-002	Lifter	1	Right	
	31	E304988-001	Link	1		
	32	E72405-001	Screw	1		
	33	E25885-001	Rear Panel	1		J
		E25885-102	Rear Panel	1		C,E, EF, A, BS, G
		E25885-003	Rear Panel	1		P, PG, U
	—	E25536-011	Rating Lavel	1	JVC	J
	—	E25096-139	Rating Lavel	1		C
	—	E25096-539	Rating Lavel	1	Made in Japan	E, EF
	—	E25096-539F	Rating Lavel	1	Made in Japan	G
	—	E25096-547	Rating Lavel	1	Made in Singapole	E, EF
	—	E25096-546	Rating Label	1		E, EF
	—	E25096-547F	Rating Lavel	1	Made in Singapole	G
	—	E25096-339	Rating Lavel	1		P, PG, U
⚠	34	QHS3876-162	Cord Stopper	1		Except for BS
⚠		QHS3876-162BS	Cord Stopper	1		BS
⚠	35	QMP1200-200	Power Cord	1		J, C
⚠		QMP7600-200	Power Cord	1		P, PG, U
⚠		QMP3900-200	Power Cord	1		E, EF, G
⚠		QMP2560-244	Power Cord	1		A
⚠		QMP9017-008BS	Power Cord	1		BS
	36	SBF3010M	Screw	1		
⚠	37	QSR0085-008U	Voltage Selector	1		P, PG, U
	38	E302764-001	Cover	1		P, PG, U
	39	E74775-001	Sheet	1		
	40	E74500-001	Headphone Bracket	1		
	41	SBSF3008M	Screw	2		
	42	E71541-001	Hazard Symbol Label	1		E, EF
	43	E49267-001	Origin Marking Label	1	Made in Japan	BS
		E49267-004	Origin Marking Label	1	Made in Singapol	BS

⚠ : Safety Parts

The Marks for Desginated Areas

A . . . . . Australia
C . . . . . Canada
E, EF . . . . . Continental Europe
G . . . . . West Germany
BS . . . . . U. K.
P, PG . . . . . U.S. Military Market
U . . . . . Other Countries
No Mark indicates all areas.

Mechanism Assembly



■ Parts List

⚠	Item	Part Number	Part Name	Q'ty	Description	Areas
	1	E11554-001	Base Ass'y	1		
	2	MMN-6F1LB8Q	Motor	1		
	3	SDSP2603N	Screw	2		
	4	E73060-001	M. Pulley	2		
	5	E74347-001	Belt	1		
	6	E74323-001	Gear	1		
	7	E60912-001	Speed Nut	3		
	8	E74325-001	Loading Gear	1		
	9	ESS2100-002	Slide Switch	1		
	10	E70267-003	Rubber Tube	1		
	11	E74349-001	Insulator	4		
	12	E74326-001	Sheet	1		
	13	PU49485	Wire Clamp	1		
	14	SBSE3005Z	Screw	2		
	15	E65923-004	Screw	1		
	16	EWR55A-001	Flat Wire	1	5 Pin	
	17	E11580-001	Mechanism Base Ass'y	1		
	18	E74421-001	Motor Bracket	1		
	19	SBSE3006Z	Screw	1		
	20	E74539-001	Spindle Motor	1		
	21	SDSP2003N	Screw	4		
	22	MDN-4RA3EWA	Feed Motor	1		
	23	E72764-001	Leaf Spring	1		
	24	QSP2K11-E02	Push Switch	1		
	25	SPSF2010Z	Screw	1		
	26	E74711-002	Turn Table Ass'y	1		
	27	E65923-005	Screw	1		
	28	E74305-001	Belt	1		
	29	E74370-002	S. Shaft Ass'y	1		
	30	EWR56A-002	SKT Wire Ass'y	1	6 Pin	
	31	E305034-001	Cam	1		
	32	E74351-001	Spring	1		
	33	E74491-001	Lock Lever	1		
	34	F74348-002	Spring	1		
	35	EWT051-004	TER Wire Ass'y	1		
	36	SDSE3006M	Screw	1		
	37	E74422-001	Special Screw	2		
	38	EWS25A-B104	SKT Wire Ass'y	1	10 Pin	
	39	OPTIMA-4S	Pickup Ass'y	1		
	40	E74332-002	Shaft	1		
	41	E304992-001	Pickup Holder	1		
	42	E74493-001	Leaf Spring	1		
	43	SDSP2006Z	Screw	1		
	44	E25796-003	CD Holder Unit	1		
	44-1	E74348-001	Clamper Spring	1		

⚠ : Safety Parts

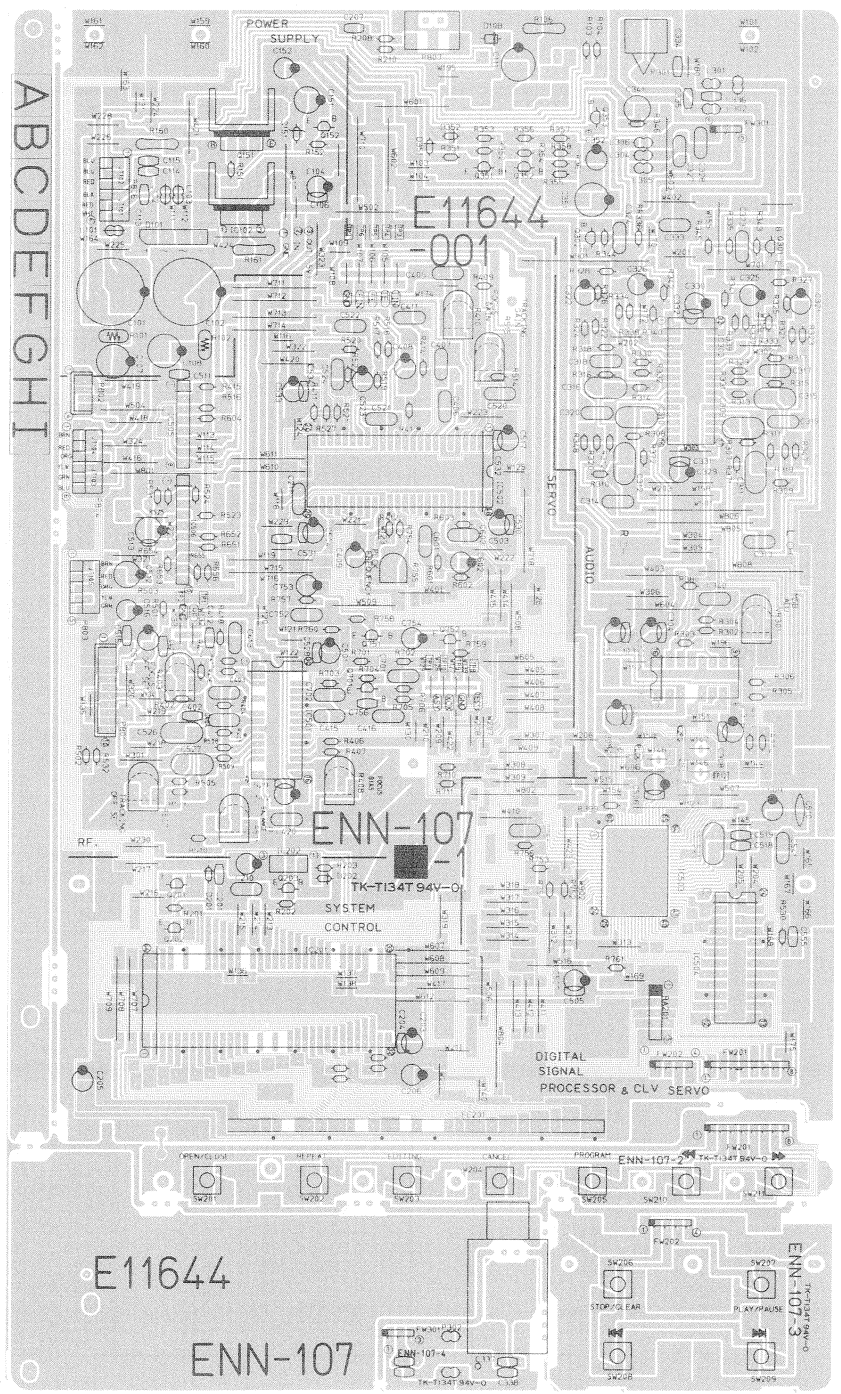
Printed Circuit Board Ass'y and Parts List

■ENN-107 ☐ Main PC Board Ass'y

Note: ENN-107 ☐ Varies according to the areas employed. See note (1) when placing an order.

Note (1)

PC Board Ass'y	Designated Areas
ENN-107 A	U.S.A.,Canada,U.K, Europe,Australia U.S.Military Market & Other Countries
ENN-107 E	West Germany



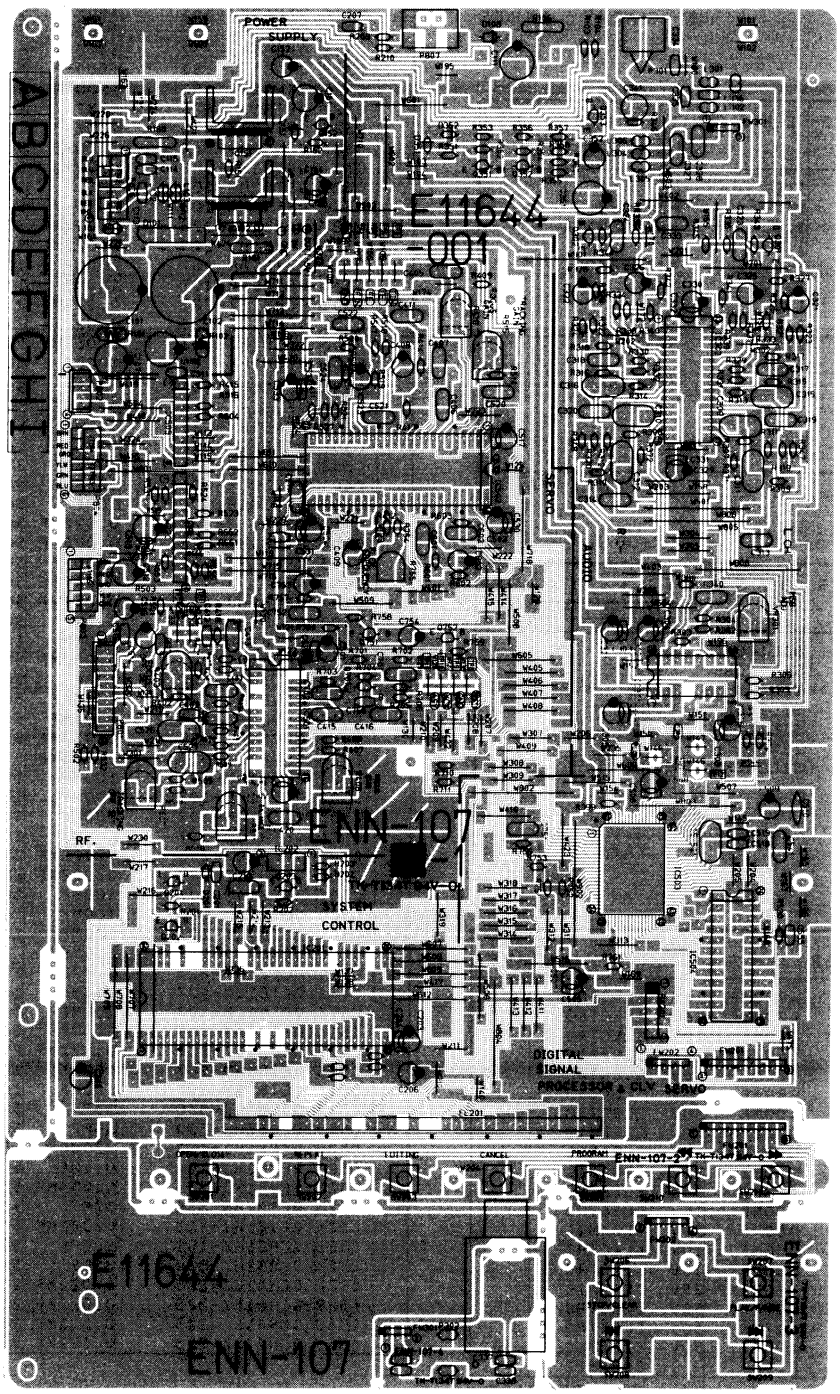
Printed Circuit Board Ass'y and Parts List

■ENN-107 ☐ Main PC Board Ass'y

Note: ENN-107 ☐ Varies according to the areas employed. See note (1) when placing an order.

Note (1)

PC Board Ass'y	Designated Areas
ENN-107 [A]	U.S.A.,Canada,U.K, Europe,Australia U.S.Military Market & Other Countries
ENN-107 [E]	West Germany



Transistors

⚠	ITEM	PART NUMBER	DESCRIPTION	MAKER	AREA
	Q151	2SB507V(D,E)	SILICON	SANYO	
	Q152	2SC1740(R,S)	SILICON	ROHM	
	Q201	DTC144ES	SILICON	ROHM	
	Q202	DTA114YS	SILICON	ROHM	
	Q203	DTC114YS	SILICON	ROHM	
	Q301	2SD1302(S,T)	SILICON	MATSUSHITA	
	Q302	2SD1302(S,T)	SILICON	MATSUSHITA	
	Q351	2SC458(C,D)	SILICON	HITACHI	
	Q352	2SC458(C,D)	SILICON	HITACHI	
	Q353	2SA1029(C,D)	SILICON	HITACHI	
	Q610	DTC114YS	SILICON	ROHM	
	Q701	2SC1740(R,S)	SILICON	ROHM	
	Q751	DTC144ES	SILICON	ROHM	
	Q752	DTC144ES	SILICON	ROHM	

⚠ : SAFETY PARTS

ICs

⚠	ITEM	PART NUMBER	DESCRIPTION	MAKER	AREA
	IC102	NJM79M05FA	I.C.		
	IC201	HD614080SC12	I.C.	HITACHI	
	IC202	MN1280(P,Q)	I.C.	MATSUSHITA	
	IC301	PCM56P	I.C.		
	IC302	M51565P	I.C.	MITSUBISHI	
	IC501	VC4089S	I.C.		
	IC502	VC4090S	I.C.		
	IC503	VC4092	I.C.		
	IC504	LC3517BS-15	I.C.	SANYO	
	IC505	STA341M(A)	I.C.		
	IC506	TA7256P	I.C.	TOSHIBA	

⚠ : SAFETY PARTS

Diodes

⚠	ITEM	PART NUMBER	DESCRIPTION	MAKER	AREA
	D101	S1VB20F	SILICON		
	D108	ERA15-02L19	SILICON		
	D151	MTZ5.6JC	ZENER	ROHM	
	D201	1SS133	SILICON	ROHM	
	D202	1SS133	SILICON	ROHM	
	D351	MTZ5.1JB	ZENER	ROHM	
	D352	1SS133	SILICON	ROHM	

⚠ : SAFETY PARTS

Capacitors

⚠	ITEM	PART NUMBER	DESCRIPTION			AREA
	C101	QETB1CM-478	4700MF	16V	ELECTRO	
	C102	QETB1CM-478	4700MF	16V	ELECTRO	
	C104	QETB1AM-107	100MF	10V	ELECTRO	
	C106	QCHB1EZ-223	0.022MF	25V	CERAMIC	
	C107	QETB1CM-227	220MF	16V	ELECTRO	
	C108	QETB1CM-227	220MF	16V	ELECTRO	
	C111	QETB1HM-107	100MF	50V	ELECTRO	
	C113	QCF21HP-223	0.022MF	50V	CERAMIC	
	C114	QCHB1EZ-223	0.022MF	25V	CERAMIC	
	C115	QCHB1EZ-223	0.022MF	25V	CERAMIC	
	C151	QEK60JM-476	47MF	6.3V	ELECTRO	
	C152	QETB1AM-107	100MF	10V	ELECTRO	
	C201	QCBB1HK-101	100PF	50V	CERAMIC	
	C202	QETB1AM-107	100MF	10V	ELECTRO	
	C203	QETB1AM-107	100MF	10V	ELECTRO	
	C204	QCHB1EZ-223	0.022MF	25V	CERAMIC	
	C205	QETB1HM-475	4.7MF	50V	ELECTRO	
	C206	QETB1HM-475	4.7MF	50V	ELECTRO	
	C207	QCBB1HK-101	100PF	50V	CERAMIC	
	C210	QCZ0205-155	1.5MF		CERAMIC	

⚠ : SAFETY PARTS

Capacitors

⚠	ITEM	PART NUMBER	DESCRIPTION			AREA
	C211	QCZ0205-155	1.5MF		CERAMIC	
	C301	QETB1AM-107	100MF	10V	ELECTRO	
	C302	QETB1AM-107	100MF	10V	ELECTRO	
	C303	QCHB1EZ-223	0.022MF	25V	CERAMIC	
	C304	QCHB1EZ-223	0.022MF	25V	CERAMIC	
	C305	QETB1AM-107	100MF	10V	ELECTRO	
	C306	QETB1AM-107	100MF	10V	ELECTRO	
	C307	QCHB1EZ-223	0.022MF	25V	CERAMIC	
	C308	QCHB1EZ-223	0.022MF	25V	CERAMIC	
	C309	QFP81HG-241	240PF	50V	POLY	
	C310	QFP81HG-241	240PF	50V	POLY	
	C311	QFP81HJ-560	56PF	50V	POLY	
	C312	QFP81HJ-560	56PF	50V	POLY	
	C313	QFN81HJ-562	5600PF	50V	MYLAR	
	C314	QFN81HJ-562	5600PF	50V	MYLAR	
	C315	QFP81HJ-561	560PF	50V	POLY	
	C316	QFP81HJ-561	560PF	50V	POLY	
	C317	QFN81HJ-332	3300PF	50V	MYLAR	
	C318	QFN81HJ-332	3300PF	50V	MYLAR	
	C319	QFN81HJ-152	1500PF	50V	MYLAR	
	C320	QFN81HJ-152	1500PF	50V	MYLAR	
	C321	QETB1AM-476	47MF	10V	ELECTRO	
	C322	QETB1AM-476	47MF	10V	ELECTRO	
	C323	QFN81HJ-562	5600PF	50V	MYLAR	
	C324	QFN81HJ-562	5600PF	50V	MYLAR	
	C325	QETB1HM-105	1MF	50V	ELECTRO	
	C326	QETB1HM-105	1MF	50V	ELECTRO	
	C327	QFV81HJ-223	0.022MF	50V	T.FILM	
	C328	QFV81HJ-223	0.022MF	50V	T.FILM	
	C329	QETB1AM-107	100MF	10V	ELECTRO	
	C330	QETB1AM-107	100MF	10V	ELECTRO	
	C331	QCHB1EZ-223	0.022MF	25V	CERAMIC	
	C332	QCHB1EZ-223	0.022MF	25V	CERAMIC	
	C333	QFN81HJ-683	0.068MF	50V	MYLAR	
	C334	QCBB1HK-101	100PF	50V	CERAMIC	
	C335	QCBB1HK-101	100PF	50V	CERAMIC	
	C340	QFV81HJ-103	0.01MF	50V	T.FILM	
	C341	QEN51HM-475	4.7MF	50V	NON POLE	
	C351	QETB1CM-477	470MF	16V	ELECTRO	
	C352	QETB1EM-106	10MF	25V	ELECTRO	
	C401	QCT30CH-100	10PF	50V	CERAMIC	
	C402	QCT30CH-100	10PF	50V	CERAMIC	
	C403	QFV81HJ-223	0.022MF	50V	T.FILM	
	C404	QFV81HJ-223	0.022MF	50V	T.FILM	
	C405	QFN81HJ-182	1800PF	50V	MYLAR	
	C406	QFN81HJ-473	0.047MF	50V	MYLAR	
	C407	QFN81HJ-473	0.047MF	50V	MYLAR	
	C408	QETB1HM-335	3.3MF	50V	ELECTRO	
	C409	QETB1AM-107	100MF	10V	ELECTRO	
	C411	QFV81HJ-823	0.082MF	50V	T.FILM	
	C412	QCT30CH-120	12PF	50V	CERAMIC	
	C413	QFN81HJ-222	2200PF	50V	MYLAR	
	C415	QFV81HJ-103	0.01MF	50V	T.FILM	
	C416	QFV81HJ-333	0.033MF	50V	T.FILM	
	C420	QFV81HJ-333	0.033MF	50V	T.FILM	
	C501	QETB1AM-107	100MF	10V	ELECTRO	
	C502	QETB1AM-107	100MF	10V	ELECTRO	
	C503	QETB1AM-107	100MF	10V	ELECTRO	
	C504	QETB1AM-107	100MF	10V	ELECTRO	
	C505	QCHB1EZ-223	0.022MF	25V	CERAMIC	
	C506	QCHB1EZ-223	0.022MF	25V	CERAMIC	
	C507	QETB1AM-107	100MF	10V	ELECTRO	
	C508	QETB1AM-107	100MF	10V	ELECTRO	
	C509	QETB1CM-107	100MF	16V	ELECTRO	
	C510	QCZ0205-155	1.5MF		CERAMIC	
	C511	QCF21HP-223	0.022MF	50V	CERAMIC	
	C512	QETB1CM-107	100MF	16V	ELECTRO	
	C513	QETB1CM-107	100MF	16V	ELECTRO	
	C514	QETB1AM-107	100MF	10V	ELECTRO	
	C515	QCHB1EZ-223	0.022MF	25V	CERAMIC	
	C516	QETB1AM-107	100MF	10V	ELECTRO	
	C517	QETB1AM-107	100MF	10V	ELECTRO	
	C518	QCSB1HJ-330	33PF	50V	CERAMIC	
	C519	QCSB1HJ-330	33PF	50V	CERAMIC	
	C520	QFN81HJ-222	2200PF	50V	MYLAR	
	C521	QFV81HJ-104	0.1MF	50V	T.FILM	
	C522	QFV81HJ-333	0.033MF	50V	T.FILM	
	C523	QETB1HM-336	33MF	50V	ELECTRO	
	C524	QFV81HJ-223	0.022MF	50V	T.FILM	
	C526	QFP81HJ-101	100PF	50V	POLY	
	C527	QFP81HJ-820	82PF	50V	POLY	
	C528	QCHB1EZ-223	0.022MF	25V	CERAMIC	
	C529	QCHB1EZ-223	0.022MF	25V	CERAMIC	
	C530	QCHB1EZ-223	0.022MF	25V	CERAMIC	
	C531	QCHB1EZ-223	0.022MF	25V	CERAMIC	

⚠ : SAFETY PARTS

Capacitors

⚠	ITEM	PART NUMBER	DESCRIPTION			AREA
	C532	QCHB1EZ-223	0.022MF	25V	CERAMIC	
	C533	QETB1AM-107	100MF	10V	ELECTRO	
	C534	QCHB1EZ-223	0.022MF	25V	CERAMIC	
	C556	QCS21HJ-100	10PF	50V	CERAMIC	A
	C556	QCS21HJ-101	100PF	50V	CERAMIC	E
	C601	QFN81HJ-223	0.022MF	50V	MYLAR	
	C602	QETB1HM-474	0.47MF	50V	ELECTRO	
	C603	QFN81HJ-182	1800PF	50V	MYLAR	
	C610	QETB1CM-476	47MF	16V	ELECTRO	
	C701	QFN81HJ-102	1000PF	50V	MYLAR	
	C702	QFV81HJ-224	0.22MF	50V	T.FILM	
	C751	QFN81HJ-102	1000PF	50V	MYLAR	
	C752	QFN81HJ-472	4700PF	50V	MYLAR	
	C753	QETB1HM-474	0.47MF	50V	ELECTRO	
	C754	QETB1HM-105	1MF	50V	ELECTRO	
	C756	QCBB1HK-471	470PF	50V	CERAMIC	

⚠ : SAFETY PARTS

Resistors

⚠	ITEM	PART NUMBER	DESCRIPTION			AREA
	R101	PTH61G05BD2R2N				
	R102	PTH61G05BD2R2N				
	R103	QRD167J-152	1.5K	1/6W	CARBON	
	R104	QRD167J-152	1.5K	1/6W	CARBON	
⚠	R106	QRZ0077-560	56	1/4W	FUSIBLE	
	R151	QRD167J-271	270	1/6W	CARBON	
	R152	QRD167J-152	1.5K	1/6W	CARBON	
⚠	R160	QRD14CJ-3R3S	3.3	1/4W	UNF.CARBON	
⚠	R161	QRZ0077-100	10	1/4W	FUSIBLE	
	R201	QRD167J-472	4.7K	1/6W	CARBON	
	R202	QRD167J-103	10K	1/6W	CARBON	
	R203	QRD167J-821	820	1/6W	CARBON	
	R208	QRD167J-471	470	1/6W	CARBON	
	R301	QVPE601-104	100K	0.15W	VARIABLE	
	R302	QRD167J-105	1M	1/6W	CARBON	
	R303	QRD167J-474	470K	1/6W	CARBON	
	R304	QRD167J-204	200K	1/6W	CARBON	
	R305	QRD167J-432	4.3K	1/6W	CARBON	
	R306	QRD167J-432	4.3K	1/6W	CARBON	
	R307	QRD167J-562	5.6K	1/6W	CARBON	
	R308	QRD167J-562	5.6K	1/6W	CARBON	
	R309	QRD167J-122	1.2K	1/6W	CARBON	
	R310	QRD167J-122	1.2K	1/6W	CARBON	
	R311	QRD167J-223	22K	1/6W	CARBON	
	R312	QRD167J-223	22K	1/6W	CARBON	
	R313	QRD167J-223	22K	1/6W	CARBON	
	R314	QRD167J-223	22K	1/6W	CARBON	
	R315	QRD167J-102	1K	1/6W	CARBON	
	R316	QRD167J-102	1K	1/6W	CARBON	
	R317	QRD167J-220	22	1/6W	CARBON	
	R318	QRD167J-220	22	1/6W	CARBON	
	R319	QRD167J-244	240K	1/6W	CARBON	
	R320	QRD167J-244	240K	1/6W	CARBON	
	R321	QRD167J-681	680	1/6W	CARBON	
	R322	QRD167J-681	680	1/6W	CARBON	
	R323	QRD167J-153	15K	1/6W	CARBON	
	R324	QRD167J-153	15K	1/6W	CARBON	
	R325	QRD167J-273	27K	1/6W	CARBON	
	R326	QRD167J-273	27K	1/6W	CARBON	
	R327	QRD167J-271	270	1/6W	CARBON	
	R328	QRD167J-271	270	1/6W	CARBON	
	R329	QRD167J-104	100K	1/6W	CARBON	
	R330	QRD167J-104	100K	1/6W	CARBON	
	R331	QRD167J-683	68K	1/6W	CARBON	
	R332	QRD167J-683	68K	1/6W	CARBON	
	R333	QRD167J-181	180	1/6W	CARBON	
	R334	QRD167J-181	180	1/6W	CARBON	
	R335	QRD167J-470	47	1/6W	CARBON	
	R336	QRD167J-470	47	1/6W	CARBON	
	R337	QRD167J-104	100K	1/6W	CARBON	
	R338	QRD167J-104	100K	1/6W	CARBON	
	R339	QRD167J-683	68K	1/6W	CARBON	
	R340	QRD167J-683	68K	1/6W	CARBON	
	R341	QRD167J-121	120	1/6W	CARBON	
	R342	QRD167J-121	120	1/6W	CARBON	
	R343	QRD167J-103	10K	1/6W	CARBON	
	R344	QRD167J-103	10K	1/6W	CARBON	
	R345	QRD167J-104	100K	1/6W	CARBON	
	R346	QRD167J-272	2.7K	1/6W	CARBON	
	R347	QRD167J-273	27K	1/6W	CARBON	
	R348	QRD167J-273	27K	1/6W	CARBON	
	R351	QRD167J-102	1K	1/6W	CARBON	
	R352	QRD167J-183	18K	1/6W	CARBON	
	R353	QRD167J-183	18K	1/6W	CARBON	
	R354	QRD167J-333	33K	1/6W	CARBON	

⚠ : SAFETY PARTS

Resistors

⚠	ITEM	PART NUMBER	DESCRIPTION			AREA
	R355	QRD167J-101	100	1/6W	CARBON	
	R356	QRD167J-104	100K	1/6W	CARBON	
	R357	QRD167J-183	18K	1/6W	CARBON	
	R358	QRD167J-181	180	1/6W	CARBON	
	R371	QRD167J-821	820	1/6W	CARBON	
	R372	QRD167J-821	820	1/6W	CARBON	
	R373	QRD167J-822	8.2K	1/6W	CARBON	
	R374	QRD167J-822	8.2K	1/6W	CARBON	
	R380	QRD167J-564	560K	1/6W	CARBON	
	R399	QRD167J-102	1K	1/6W	CARBON	
	R401	QRD167J-472	4.7K	1/6W	CARBON	
	R402	QRD167J-472	4.7K	1/6W	CARBON	
	R403	QVPE601-203	20K	0.15W	VARIABLE	
	R404	QRD167J-272	2.7K	1/6W	CARBON	
	R405	QRD167J-272	2.7K	1/6W	CARBON	
	R406	QRD167J-113	11K	1/6W	CARBON	
	R407	QRD167J-104	100K	1/6W	CARBON	
	R408	QVPE601-503	50K	0.15W	VARIABLE	
⚠	R409	QRV144F-4701	4.7K	1/4W	M.FILM	
	R410	QVPE601-203	20K	0.15W	VARIABLE	
	R411	QRD167J-514	510K	1/6W	CARBON	
⚠	R412	QRV144F-1203	120K	1/4W	M.FILM	
	R413	QRD167J-124	120K	1/6W	CARBON	
	R414	QRD167J-473	47K	1/6W	CARBON	
	R415	QRD167J-2R2	2.2	1/6W	CARBON	
	R416	QRD167J-822	8.2K	1/6W	CARBON	
	R417	QRD167J-822	8.2K	1/6W	CARBON	
	R418	QRD167J-392	3.9K	1/6W	CARBON	
	R501	QRD167J-221	220	1/6W	CARBON	
	R502	QRD167J-102	1K	1/6W	CARBON	
	R508	QRD167J-183	18K	1/6W	CARBON	
	R509	QRD167J-183	18K	1/6W	CARBON	
	R510	QRD167J-223	22K	1/6W	CARBON	
	R511	QVPE601-203	20K	0.15W	VARIABLE	
⚠	R514	QRV144F-4701	4.7K	1/4W	M.FILM	
	R515	QVPE601-203	20K	0.15W	VARIABLE	
	R516	QRD167J-2R2	2.2	1/6W	CARBON	
	R517	QRD167J-224	220K	1/6W	CARBON	
	R518	QRD167J-184	180K	1/6W	CARBON	
	R519	QRD167J-103	10K	1/6W	CARBON	
	R520	QRD167J-562	5.6K	1/6W	CARBON	
	R521	QRD167J-822	8.2K	1/6W	CARBON	
	R522	QRD167J-273	27K	1/6W	CARBON	
	R523	QRD167J-472	4.7K	1/6W	CARBON	
	R524	QRD167J-822	8.2K	1/6W	CARBON	
	R525	QRD167J-2R2	2.2	1/6W	CARBON	
	R527	QRD167J-104	100K	1/6W	CARBON	
	R530	QRD167J-102	1K	1/6W	CARBON	
	R531	QRD167J-2R2	2.2	1/6W	CARBON	
	R532	QRD167J-333	33K	1/6W	CARBON	
	R601	QRD167J-203	20K	1/6W	CARBON	
	R602	QRD167J-105	1M	1/6W	CARBON	
	R603	QRD167J-823	82K	1/6W	CARBON	
	R604	QRD167J-2R2	2.2	1/6W	CARBON	
	R611	QRD167J-104	100K	1/6W	CARBON	
	R612	QRD167J-472	4.7K	1/6W	CARBON	
	R652	QRD167J-104	100K	1/6W	CARBON	
	R653	QRD167J-124	120K	1/6W	CARBON	
	R654	QRD167J-124	120K	1/6W	CARBON	
	R655	QRD167J-3R3	3.3	1/6W	CARBON	
	R656	QRD167J-3R3	3.3	1/6W	CARBON	
	R701	QRD167J-102	1K	1/6W	CARBON	
	R702	QRD167J-103	10K	1/6W	CARBON	
	R703	QRD167J-104	100K	1/6W	CARBON	
	R704	QRD167J-103	10K	1/6W	CARBON	
	R705	QRD167J-183	18K	1/6W	CARBON	
	R706	QRD167J-183	18K	1/6W	CARBON	
	R710	QRD167J-102	1K	1/6W	CARBON	
	R711	QRD167J-102	1K	1/6W	CARBON	
⚠	R751	QRV144F-1003	100K	1/4W	M.FILM	
⚠	R752	QRV144F-1003	100K	1/4W	M.FILM	
	R753	QRD167J-183	18K	1/6W	CARBON	
⚠	R754	QRV144F-3601	3.6K	1/4W	M.FILM	
	R755	QVPC604-102	1K	0.3W	VARIABLE	
	R756	QRD167J-104	100K	1/6W	CARBON	
	R757	QRD167J-222	2.2K	1/6W	CARBON	
	R758	QRD167J-104	100K	1/6W	CARBON	
	R759	QRD167J-103	10K	1/6W	CARBON	
	R760	QRD167J-103	10K	1/6W	CARBON	
	R761	QRD167J-102	1K	1/6W	CARBON	
	RA201	QRB045J-104	100K	1/8W	R.NETWORK	

⚠ : SAFETY PARTS

Others

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
		EWT011-076	TERMINAL WIRE	
		E11644-001	CIRCUIT BOARD	
		E70306-001	HEAT SINK	
		E74482-001	BRACKET	
		E74739-001	FELT SPACER	
		SBSE3008CC	SCREW	
	L201	FBA04HA900NA-00	FEIET COIL	
	L301	FBA04HA900NA-00	FEIET COIL	
	L302	FBA04HA900NA-00	FEIET COIL	
	L303	EQL4004-1R0	INDUCTOR	
	L305	EQL4004-1R0	INDUCTOR	
	L306	EQL4004-1R0	INDUCTOR	
	L307	FBA04HA900NA-00	FEIET COIL	
	L308	FBA04HA900NA-00	FEIET COIL	
	P301	EMN00TV-201A	2P PIN JACK	
	P302	QMS6302-131A	HEADPHONE JACK	
	P801	EMV5109-010A	PLUG ASSY	
	P802	EMV5109-004A	PLUG ASSY	
	P807	QMS3533-001A	MINI JACK	
	FL201	ELU0001-056	FL TUBE	

⚠ : SAFETY PARTS

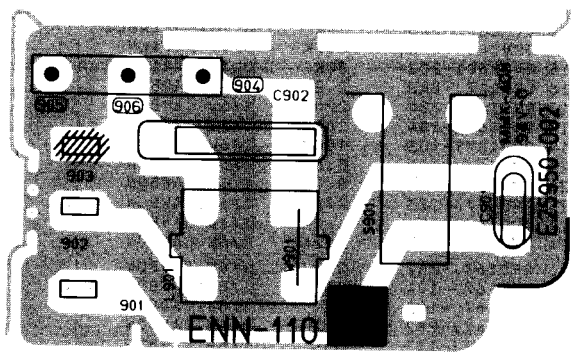
Others

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
	FW201	EWR38B-08SST	FLAT WIRE	
	FW202	EWR34B-16SST	FLAT WIRE	
	FW301	EWR33B-35SST	FLAT WIRE	
	JT101	EMV7122-003Z	CONNECTOR	
	JT102	EMV7122-003Z	CONNECTOR	
	JT103	EMV7122-003Z	CONNECTOR	
	JT104	EMV7122-003Z	CONNECTOR	
	JT105	EMV7122-005Z	CONNECTOR	
	OS501	ECX0084-672EH	RESONATOR	
	SW201	ESP0001-015	TACT SWITCH	
	SW202	ESP0001-015	TACT SWITCH	
	SW203	ESP0001-015	TACT SWITCH	
	SW204	ESP0001-015	TACT SWITCH	
	SW205	ESP0001-015	TACT SWITCH	
	SW206	ESP0001-015	TACT SWITCH	
	SW207	ESP0001-015	TACT SWITCH	
	SW208	ESP0001-015	TACT SWITCH	
	SW209	ESP0001-015	TACT SWITCH	
	SW210	ESP0001-015	TACT SWITCH	
	SW211	ESP0001-015	TACT SWITCH	

⚠ : SAFETY PARTS

■ENN-110 □ Primary PC Board Ass'y

Note: ENN-110 □ Varies according to the areas employed. See note (1) when placing an order.



Note (1)

PC Board Ass'y	Designated Areas
ENN-110 B	U.S.A.,Canada
ENN-110 C	Europe,Australia, West Germany
ENN-110 D BS	U.K.
ENN-110 E	U.S.Military Market & Other Countries

Capacitors

⚠	ITEM	PART NUMBER	DESCRIPTION			AREA
	C901	QCZ9018-103	0.01MF		CERAMIC	E
	C901	QCZ9038-103	0.01MF		CERAMIC	B
	C901	QCZ9038-103	0.01MF		CERAMIC	C
	C901	QCZ9038-103BS	0.01MF		CERAMIC	DBS
	C902	QFZ9010-223	0.022MF	250V	M.PAPER	C
	C902	QFZ9019-223	0.022MF		M.MYLAR	B
	C902	QFZ9020-223	0.022MF		M.MYLAR	E
	C902	QFZ9020-223BS	0.022MF		M.MYLAR	DBS

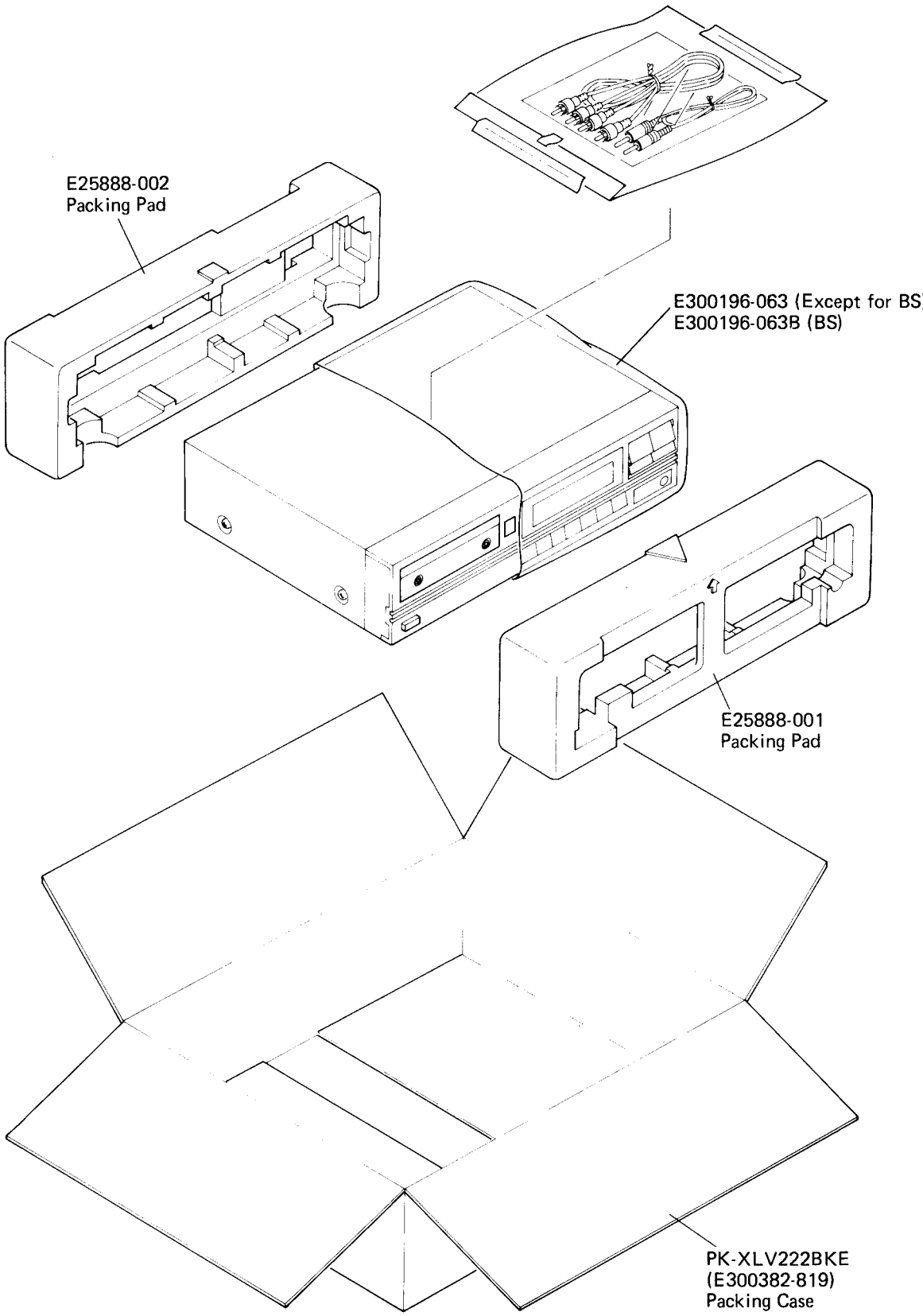
⚠ : SAFETY PARTS

Others

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
		E25950-002	CIRCUIT BOARD	B
		E25950-002	CIRCUIT BOARD	C
		E25950-002	CIRCUIT BOARD	E
		E25950-002BS	CIRCUIT BOARD	DBS
		E65508-002	TAB	
		E67764-203	WRAPPING TERMINAL	
		QSP4C11-E01	PUSH SWITCH	B
		QSP4C11-E01	PUSH SWITCH	C
		QSP4C11-E01	PUSH SWITCH	E
		QSP4C11-E01BS	PUSH SWITCH	DBS
	L901	ENZ5002-005	LINE FILTER	B
	L901	ENZ5002-005	LINE FILTER	C
	L901	ENZ5002-005	LINE FILTER	E
	L901	ENZ5002-005BS	LINE FILTER	DBS

⚠ : SAFETY PARTS

Packing Materials and Parts Numbers



Accessories List

⚠	Item	Part Number	Part Name	Q'ty	Description	Areas
		E30580-1448A	Instruction Book	1		J,C,E,EF,A,G,P,PG,U
		E30580-1448ABS	Instruction Book	1		BS
		BT20025J	Warranty Card	1		J
		BT20029C	Warranty Card	1	for Australia	A
		BT20047C	Warranty Card	1		J,P,PG
		BT20060	Warranty Card	1		BS
		BT20064	Warranty Card	1		G
		BT20098	Warranty Card	1	for New Zealand	A
		BT20046C	Service Infomation Card	1		J,P,PG
		BT20071A	Service Center List	1		C
		BT20044E	Safety Instruction Sheet	1		J
		BT20066	EEC Agency	1		G,BS
		E74737-001	Keeping Card	2		J
⚠		E04056	Siemens Plug	1		PG,U
		EWP302-011	Signal Cord	1		
		EWP805-001	1P Plug Cord	1		
		E300196-010	Envelope	1	for Instruction Book	Except for BS
		E300196-010B	Envelope	1	for Instruction Book	BS
		E66416-003	Envelope	1	for Warranty Card	

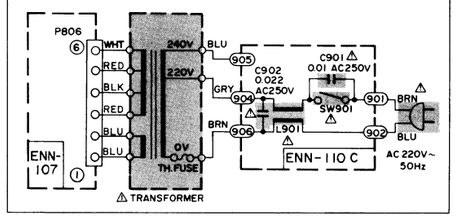
The Marks for Designated Areas

J·····U.S.A.
C·····Canada
E,EF ·····Europe
A·····Australia
G·····West Germany
BS·····U.K.
P,PG·····U.S.Military Market
U·····Other Countries

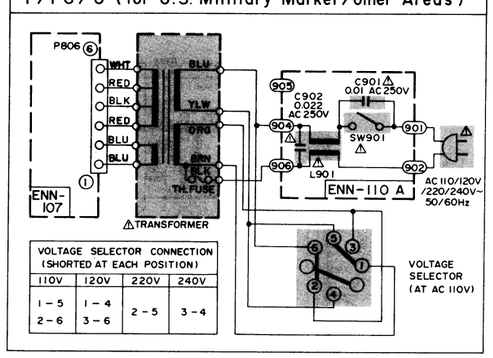
No mark indicates all areas.

(2) Power Supply Section

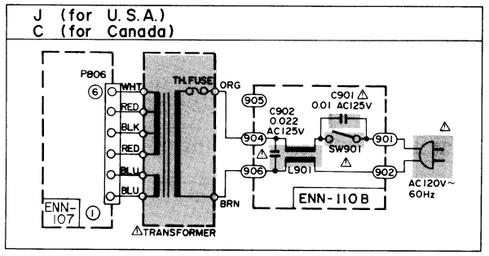
E (for Continenal Europe)
ES (for Spain)



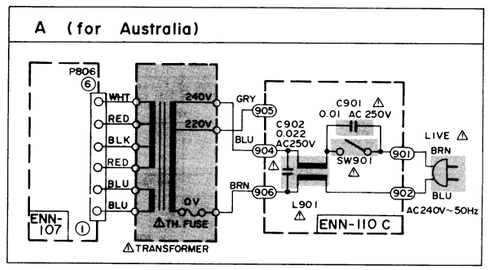
P/PG/U (for U.S. Millitary Market/other Areas)



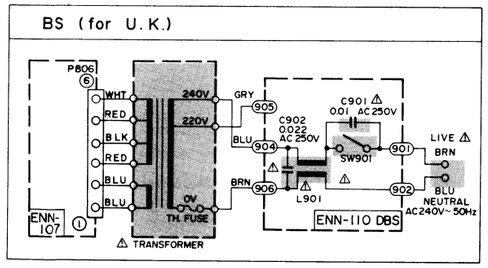
J (for U.S.A.)
C (for Canada)



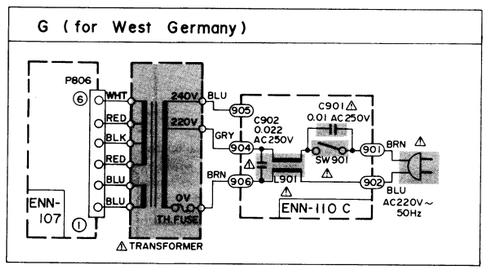
A (for Australia)



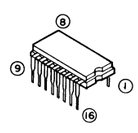
BS (for U.K.)



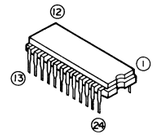
G (for West Germany)



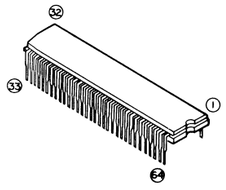
IC102: NJM79M05A	IC501: VC4089S
IC201: HD614080SC12	IC502: VC4090S
IC202: MN1280 (P, Q)	IC503: VC4092
IC301: PCM56P	IC504: LC3517BS-15
IC302: M51565P	IC505: STA341M
	IC506: TA7256P



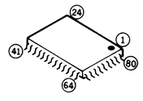
IC301: PCM56P



IC504: LC3517BS-15



IC201: HD614080SC12



IC503: VC4092

● Pin Voltage List (Values measured in the stop mode)

IC503: VC4092

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	0 V	21	–	41	2.4 V	61	1.2 V
2	0 V	22	–	42	2.4 V	62	–
3	0 V	23	0 V	43	2.4 V	63	–
4	0 V	24	0 V	44	2.4 V	64	–
5	2.3 V	25	4.8 V	45	2.4 V	65	–
6	2.3 V	26	4.8 V	46	2.4 V	66	–
7	0 V	27	–	47	2.4 V	67	–
8	2.3 V	28	0 V	48	2.4 V	68	–
9	2.2 V	29	2.8 V	49	4.3 V	69	–
10	0 V	30	2.8 V	50	2.3 V	70	–
11	2.5 V	31	2.8 V	51	2.3 V	71	–
12	0 V	32	2.8 V	52	2.3 V	72	–
13	–	33	–	53	2.3 V	73	4.8 V
14	–	34	2.5 V	54	2.3 V	74	–
15	–	35	2.5 V	55	0 V	75	–
16	4.8 V	36	2.5 V	56	0 V	76	2.3 V
17	0.08 V	37	2.5 V	57	0 V	77	–
18	0.08 V	38	2.5 V	58	0 V	78	–
19	4.8 V	39	2.5 V	59	0 V	79	2.4 V
20	–	40	2.5 V	60	1.2 V	80	2.4 V

IC302: M51565P

Pin No.	Voltage	Pin No.	Voltage
1	+5 V	17	0 V
2	0 V	18	0 V
3	0 V	19	0 V
4	0 V	20	0 V
5	0 V	21	+5 V
6	0 V	22	0 V
7	0 V	23	0 V
8	0 V	24	0 V
9	0 V	25	0 V
10	0 V	26	0 V
11	+5 V	27	0 V
12	0 V	28	0 V
13	0 V	29	0 V
14	0 V	30	0 V
15	–	31	0 V
16	–	32	-5 V

IC501: VC4089S

Pin No.	Voltage	Pin No.	Voltage
1	0 V	16	1.1 V
2	0 V	17	-4.8 V
3	0 V	18	0 V
4	–	19	0 V
5	–	20	0 V
6	–	21	-4.3 V
7	0 V	22	0 V
8	0 V	23	-3.3 V
9	0 V	24	0 V
10	0 V	25	0 V
11	0 V	26	2.4 V
12	0 V	27	2.3 V
13	0 V	28	0.1 V
14	–	29	–
15	0 V	30	4.8 V

IC301: PCM56P

Pin No.	Voltage
1	-5 V
2	0 V
3	+5 V
4	–
5	–
6	–
7	0 V
8	-5 V
9	0 V
10	0 V
11	0 V
12	0 V
13	0 V
14	–
15	–
16	+5 V

IC502: VC4090S

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	-5 V	17	-0.5 V	33	2.6 V
2	-4.8 V	18	0 V	34	2.6 V
3	0 V	19	0 V	35	2.1 V
4	0 V	20	0 V	36	2.3 V
5	0 V	21	0 V	37	3.3 V
6	0 V	22	0 V	38	1.9 V
7	0 V	23	-4.8 V	39	0 V
8	0 V	24	+5 V	40	0 V
9	0 V	25	-5.0 V	41	0 V
10	0 V	26	0 V	42	0 V
11	0 V	27	–	43	5.0 V
12	0 V	28	4.8 V	44	0 V
13	0.6 V	29	4.8 V	45	0 V
14	0 V	30	4.8 V	46	-2.4 V
15	0 V	31	4.8 V	47	0 V
16	5.0 V	32	0 V	48	0 V

IC201: HD6104080SC12

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	–	14	–	27	0 V	40	–	53	0 V
2	–	15	–	28	0 V	41	0 V	54	0 V
3	–	16	–	29	0 V	42	0 V	55	5.0 V
4	–	17	–	30	0 V	43	0 V	56	5.0 V
5	–	18	–	31	5.0 V	44	0 V	57	5.0 V
6	–	19	-26 V	32	+5 V	45	5.0 V	58	–
7	–	20	–	33	5.0V	46	5.0 V	59	–
8	–	21	+5 V	34	0 V	47	5.0 V	60	–
9	–	22	–	35	–	48	5.0 V	61	–
10	–	23	0 V	36	5.0 V	49	0 V	62	–
11	–	24	0 V	37	5.0 V	50	+5 V	63	–
12	–	25	0 V	38	0 V	51	–	64	–
13	–	26	5.0 V	39	0V	52	–		

Notes:

1. ——— indicates positive B power supply.
2. – – – – – indicates negative B power supply.
3. ▒▒ indicates signal path.
4. When replacing the parts in the darkened area (▒▒) and those marked with ⚠, be sure to use the designated parts to ensure safety.
5. This is the standard circuit diagram. The design and contents are subject to change without notice.

Schematic Diagrams

(1) Main Section